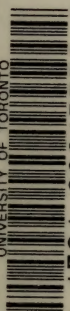
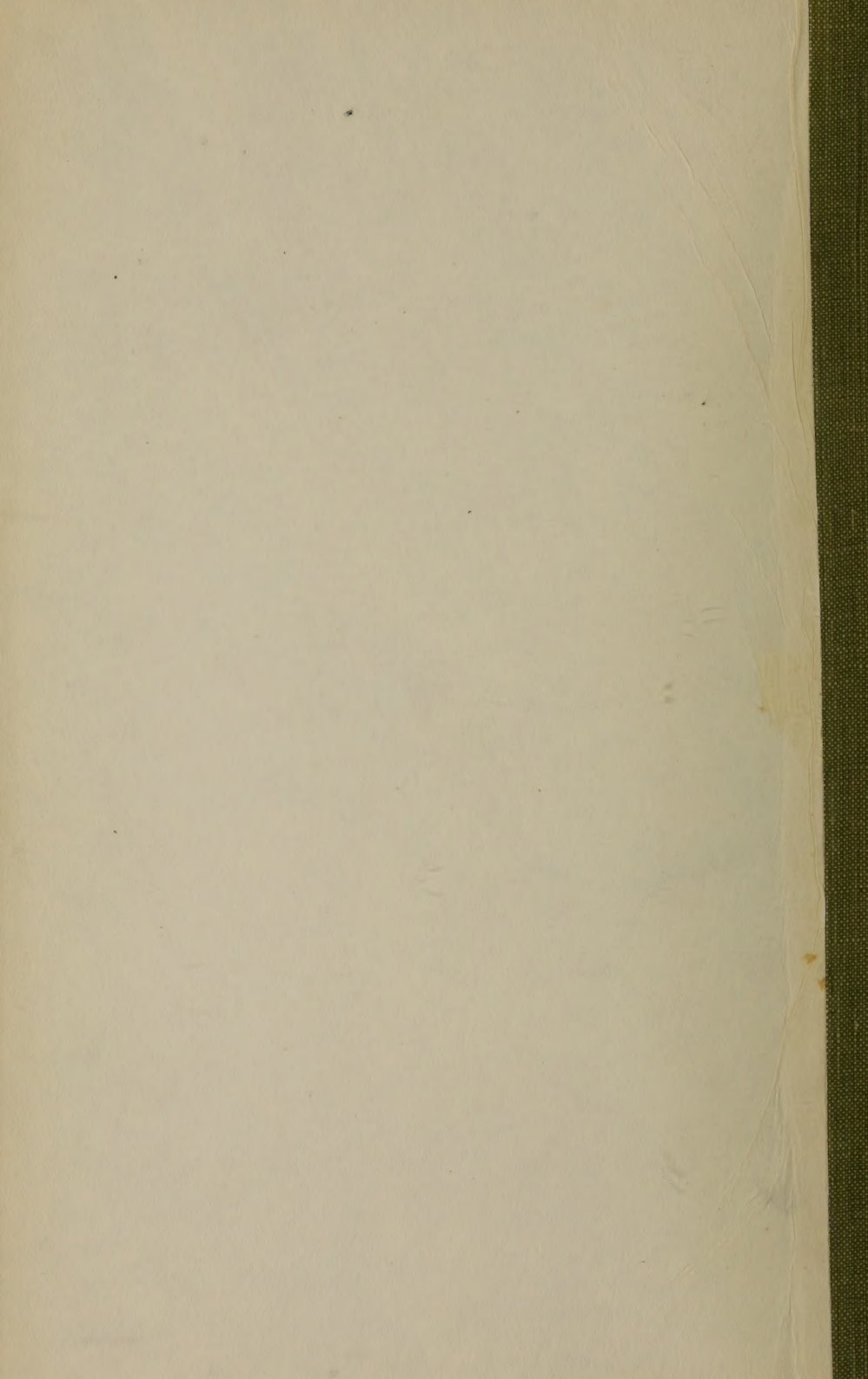


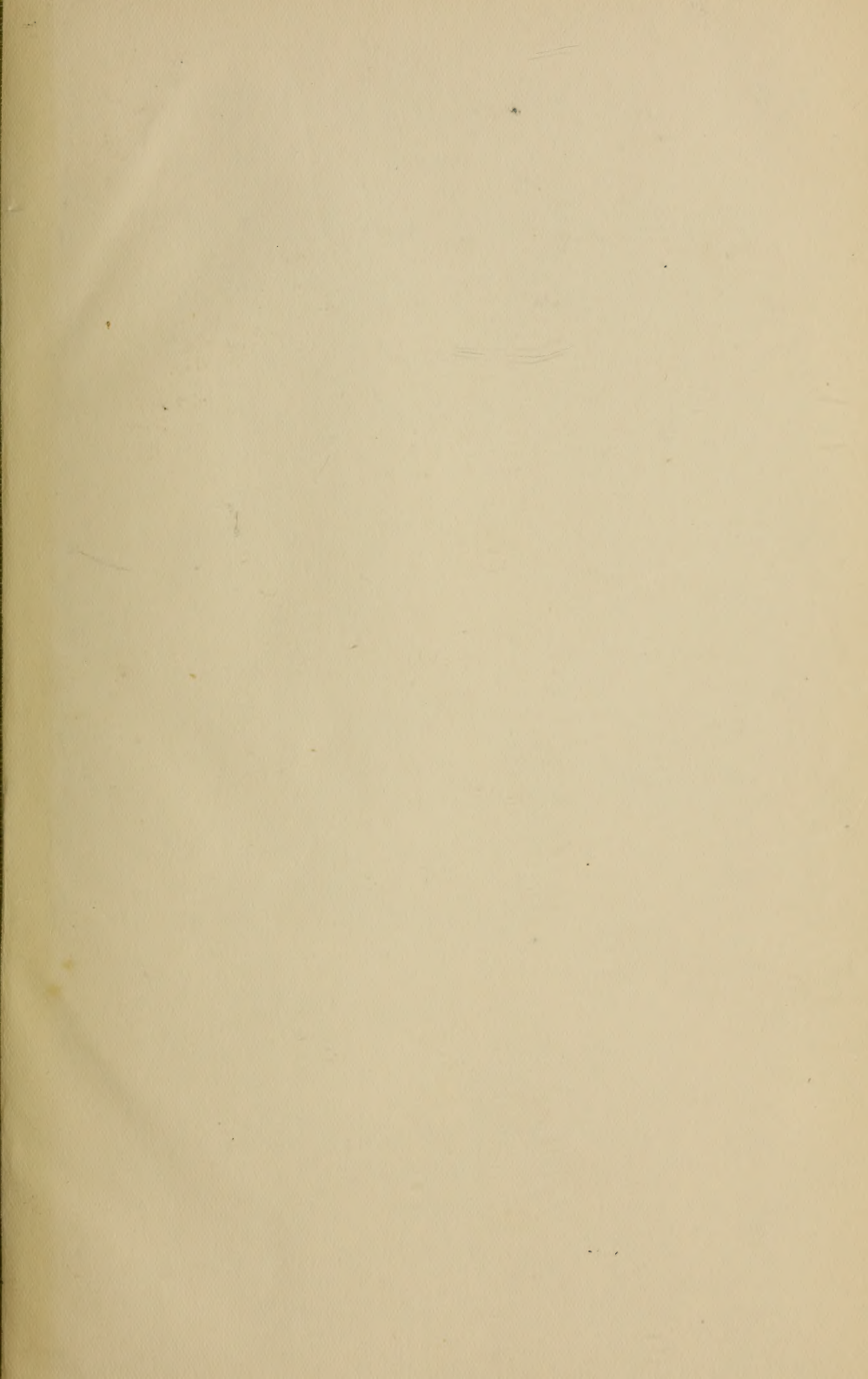
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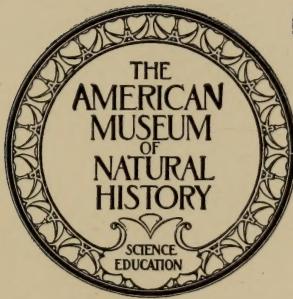
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# ANTHROPOLOGICAL PAPERS OF THE AMERICAN MUSEUM OF NATURAL HISTORY

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III

CONTENTS OF VOLUME XV

|           |  |     |
|-----------|--|-----|
| Part I.   | Pueblo Ruins of the Galisteo Basin, New Mexico. (Plates I-IV). |     |
|           | By N. C. Nelson. 1914. . . . .                                 | 1   |
| Part II.  | The Horse and the Dog in Hidatsa Culture. By Gilbert L.        |     |
|           | Wilson. 1924. . . . .  | 125 |
| Part III. | The Musical Instruments of the Inca (Plates V-IX). By Charles  |     |
|           | W. Mead. 1924. . . . .   | 313 |
| Index .   | . . . . .  | 349 |





ANTHROPOLOGICAL PAPERS

OF THE

**American Museum of Natural  
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Vol. XV, Part I.

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PUEBLO RUINS OF THE GALISTEO BASIN,  
NEW MEXICO

BY

N. C. NELSON

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NEW YORK :

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1914.



PUEBLO RUINS OF THE GALISTEO BASIN, NEW MEXICO.

By N. C. NELSON.





# CONTENTS.

|   | PAGE. |
|---|-------|
| INTRODUCTION . . . . .                                  | 7     |
| HISTORICAL INTRODUCTION . . . . .                       | 12    |
| EARLY EXPLORATIONS . . . . .                            | 12    |
| IDENTITY OF CORONADO'S GALISTEO PUEBLOS . . . . .       | 16    |
| GALISTEO PUEBLOS MENTIONED BY LATER EXPLORERS . . . . . | 22    |
| THE TANOS UNDER SPANISH RULE . . . . .                  | 26    |
| SUMMARY AND CONCLUSIONS . . . . .                       | 31    |
| DESCRIPTION OF THE GALISTEO BASIN . . . . .             | 34    |
| TOPOGRAPHICAL FEATURES . . . . .                        | 35    |
| RESOURCES . . . . .                                     | 38    |
| Streams and Springs . . . . .                           | 38    |
| Climate . . . . .                                       | 39    |
| Flora . . . . .   | 39    |
| Fauna . . . . .   | 40    |
| PUEBLO SAN CRISTOBAL . . . . .                          | 41    |
| SITUATION . . . . .                                     | 41    |
| GENERAL DESCRIPTION . . . . .                           | 42    |
| Size . . . . .  | 42    |
| Communal Buildings . . . . .                            | 43    |
| Courts . . . . .  | 44    |
| Kivas . . . . .   | 45    |
| Refuse Heaps . . . . .                                  | 46    |
| Reservoirs . . . . .                                    | 46    |
| Watch Tower . . . . .                                   | 47    |
| Rock-shelters . . . . .                                 | 47    |
| Chapel . . . . .  | 48    |
| EXCAVATIONS CONDUCTED . . . . .                         | 49    |
| Building I . . . . .                                    | 49    |
| Building II . . . . .                                   | 51    |
| Building III . . . . .                                  | 52    |
| Buildings IV-VI, XVIII, and XIX . . . . .               | 56    |
| Building VII . . . . .                                  | 56    |
| Building VIII . . . . .                                 | 56    |
| Building IX a, b. . . . .                               | 57    |
| Building X . . . . .                                    | 59    |
| Building XI . . . . .                                   | 63    |
| Buildings XII, XIII, and XVII . . . . .                 | 63    |
| Buildings XIV-XVI . . . . .                             | 65    |
| Refuse Heaps . . . . .                                  | 65    |
| RESULTS AND CONCLUSIONS . . . . .                       | 66    |
| PUEBLO LARGO . . . . .                                  | 68    |
| SITUATION . . . . .                                     | 68    |

|   | PAGE, |
|---|-------|
| GENERAL DESCRIPTION . . . . .                         | 69    |
| Communal Buildings, Kivas, and Refuse Heaps . . . . . | 69    |
| Shrine . . . . .                                      | 70    |
| EXCAVATIONS . . . . .                                 | 72    |
| RESULTS AND CONCLUSIONS . . . . .                     | 72    |
| PUEBLO COLORADO . . . . .                             | 74    |
| SITUATION . . . . .                                   | 74    |
| GENERAL DESCRIPTION . . . . .                         | 75    |
| Communal Buildings . . . . .                          | 75    |
| Kivas . . . . .                                       | 76    |
| Refuse Heaps . . . . .                                | 77    |
| Reservoir . . . . .                                   | 77    |
| EXCAVATIONS . . . . .                                 | 78    |
| Building IV . . . . .                                 | 78    |
| RESULTS AND CONCLUSIONS . . . . .                     | 79    |
| PUEBLO SHÉ . . . . .                                  | 80    |
| SITUATION . . . . .                                   | 80    |
| GENERAL DESCRIPTION . . . . .                         | 81    |
| Communal Buildings . . . . .                          | 81    |
| Kivas . . . . .                                       | 81    |
| Watch Tower . . . . .                                 | 82    |
| Refuse Heaps . . . . .                                | 82    |
| Springs and Reservoirs . . . . .                      | 82    |
| EXCAVATIONS . . . . .                                 | 83    |
| RESULTS AND CONCLUSIONS . . . . .                     | 84    |
| PUEBLO BLANCO . . . . .                               | 85    |
| SITUATION . . . . .                                   | 85    |
| GENERAL DESCRIPTION . . . . .                         | 86    |
| Communal Buildings . . . . .                          | 86    |
| Kivas . . . . .                                       | 87    |
| Refuse Heaps . . . . .                                | 88    |
| Reservoirs . . . . .                                  | 88    |
| EXCAVATIONS . . . . .                                 | 90    |
| General Observations . . . . .                        | 90    |
| Inter-mural Shrine . . . . .                          | 90    |
| RESULTS AND CONCLUSIONS . . . . .                     | 93    |
| PUEBLO SAN LAZARO . . . . .                           | 95    |
| SITUATION . . . . .                                   | 95    |
| GENERAL DESCRIPTION . . . . .                         | 96    |
| Historic Ruins . . . . .                              | 97    |
| Chapel . . . . .                                      | 97    |
| Prehistoric Ruins . . . . .                           | 98    |
| Size of Pueblo . . . . .                              | 99    |
| Refuse Heaps . . . . .                                | 99    |
| Reservoirs . . . . .                                  | 99    |
| EXCAVATIONS . . . . .                                 | 100   |
| RESULTS AND CONCLUSIONS . . . . .                     | 101   |
| PUEBLO GALISTEO . . . . .                             | 103   |
| SITUATION . . . . .                                   | 103   |



|                                   | PAGE. |
|-----------------------------------|-------|
| GENERAL DESCRIPTION . . . . .     | 104   |
| Communal Buildings . . . . .      | 105   |
| Church . . . . .                  | 107   |
| Refuse Heaps . . . . .            | 107   |
| EXCAVATIONS . . . . .             | 107   |
| RESULTS AND CONCLUSIONS . . . . . | 108   |
| GENERAL CONCLUSIONS . . . . .     | 110   |
| TABLE OF MEASUREMENTS . . . . .   | 113   |

## ILLUSTRATIONS.

## PLATES.

1. San Cristobal.
2. Pueblo Colorado.
3. Pueblo Blanco.
4. San Lazaro.

## TEXT FIGURES.

- |   |       |
|---|-------|
| Map of the Galisteo Basin, New Mexico . . . . .                               | 36-37 |
| 1. Building I, San Cristobal . . . . .  | 50    |
| 2. Building III, San Cristobal . . . . .                                      | 53    |
| 3. Southwest Corner of Room 21, Building III, San Cristobal . . . . .         | 54    |
| 4. Outer South Side Rooms of Building III, San Cristobal . . . . .            | 55    |
| 5. Doorway leading into Room 20, Building IX b, San Cristobal . . . . .       | 58    |
| 6. Northwest Corner of Room 13, Building X, San Cristobal . . . . .           | 58    |
| 7. Cross-section of Building X, San Cristobal . . . . .                       | 60    |
| 8. Room 13, Building X, San Cristobal . . . . .                               | 62    |
| 9. Typical Fireplace found in Room 12, Building XIII, San Cristobal . . . . . | 64    |
| 10. Shrine at Pueblo Largo . . . . .  | 71    |
| 11. Reservoir Dam near Pueblo Blanco . . . . .                                | 89    |
| 12. Shrine found in Room 3, Building X, Pueblo Largo . . . . .                | 91    |
| 13. Room 11, Building XIII, Pueblo Galisteo . . . . .                         | 105   |

## PLANS.

- I. Pueblo San Cristobal.
- II. Pueblo Largo.
- III. Pueblo Colorado.
- IV. Pueblo Shé.
- V. Pueblo Blanco.
- VI. Pueblo San Lazaro.
- VII. Pueblo Galisteo.



## INTRODUCTION.

This paper is a report based upon field investigations carried out in New Mexico mainly during the summer of 1912 and made possible through funds provided by Mr. Archer M. Huntington. The choice of the Galisteo basin as a desirable locality for research was made only after the completion of a cursory survey of the three hundred mile stretch of the Rio Grande drainage lying between El Paso and Santa Fe. Less than six weeks were devoted to this preliminary work, which in consequence was far from exhaustive. Some unrecorded archaeological sites in the form of caves, rock-shelters, camping grounds, and groups of pictographs were found,<sup>1</sup> however, in the regions about Las Cruces and Elephant Butte, but these places revealed no facts of special importance that need be considered at this time.

Several groups of more or less well-known pueblo ruins were examined in the vicinities of Magdalena, Bernalillo, and Cochiti, on the west side of the Rio Grande,<sup>2</sup> but the most extensive and on the whole the best preserved remains were found at a considerable distance east of this river. These latter sites fall into four localized groups, the first and southernmost being the supposed Piro or Tompiro pueblos<sup>3</sup> lying in the broken mesa country twenty to thirty miles directly south of Willard and the salt lakes of the Estancia Valley. Five of these partly historic but long ruined pueblos are known locally as Gran Quivira, Montezuma, Pardo, Colorado, and Blanco. Only the first and the last named places were examined. The second group lies to the west of Willard and consists of six or more ruins scattered along the east base of the Manzano Mountains, mostly north of the Abō pass or canyon. Among these are the historic Piro pueblo of Abō and the equally well known Tigua pueblos of Quarai, Tajique, and Chilili.<sup>4</sup> Some small house sites, caves, and collections of pictographs are also to be found here. Farther north, in the rugged country immediately east and north of the Sandia range, lies a third group of ruins, regarded as some of the prehistoric

---

<sup>1</sup> A small pueblo ruin was also located, by reports, between the Rio Grande and the Caballos Mountains. Its presence is of some interest in view of Bandelier's opinion that the Pueblo range did not extend much below San Marcial.

<sup>2</sup> Pueblo Kotyiti, located on Potrero Viejo seven miles northwest of Cochiti, was completely excavated late in the season. This historic village, according to Spanish records, was built and occupied by Keresan Indians during the rebellion of 1680-92 and was destroyed by Diego de Vargas in 1694. Nothing of unusual interest was brought to light, but the results, such as they are, will be published elsewhere.

<sup>3</sup> See article "Piros" by F. W. Hodge, *Handbook of American Indians*, Bulletin 30, Bureau of American Ethnology, Part 2, p. 261.

<sup>4</sup> See separate pueblo articles by Hodge, *op. cit.*

and early historic homes of the Tanos. There are nine or ten of them, the principal ones, so far as now known, being San Pedro Viejo, near the source of the Arroyo San Pedro, and El Tunque, located about 13 miles downstream, close to the northeastern extremity of the Sandia Mountains. The fourth and last group and the one in which our present interest centers consists of eight large Tano ruins, strung along the borders of the Galisteo basin, an eroded treeless depression lying about twenty to thirty miles northeast of the above-mentioned Sandia range and nearly the same distance south of Santa Fe. With one exception these eight ruins are distributed on the banks of as many different streamlets that unite near the little Mexican town of Galisteo to form Galisteo Creek, perhaps the principal eastern tributary of the Rio Grande in New Mexico. Viewed from Galisteo, the largest and most important ruin, Pueblo San Cristobal, is located six miles to the east; three of the pueblos, viz., Largo, Colorado, and Shé, lie from five to eight miles to the southeast; Pueblo Blanco lies seven miles to the southwest; and Pueblo Galisteo or Tanos, as it is called locally, lies one and a half miles to the northeast, close to the Santa Fe Railroad and somewhat central in the basin. Immediately beyond the Galisteo basin proper, on a southern tributary of Galisteo Creek and six miles west of Galisteo, we have Pueblo San Lazaro, and seven miles to the northwest, on a northern tributary, is Pueblo San Marcos, close to the Cerrillos peaks.<sup>1</sup>

For some unknown reason, but probably in part on account of their relative modernity and also their less picturesque and romantic setting as compared with the cliff-dwellings, these Rio Grande pueblo remains have hitherto received little scientific attention.<sup>2</sup> Adolf Bandelier indeed visited a few of the sites and reported most of the others as long ago as 1882,<sup>3</sup> and we have besides a number of descriptions, mostly fanciful, of Gran Quivira, or as it is called in recent scientific literature, Tabira. Thus, of the eight large Galisteo pueblos, Bandelier examined only four and it is safe to state that at least three of the remaining half were never before seen by an archaeologist.

The great size of the Galisteo pueblos was most impressive. Their proximity and accessibility as a group could hardly be duplicated anywhere in the Southwest. Hence, when the owners of the various ruins, with but one or two exceptions, expressed their willingness to permit excavation there was little room for choice. Four, and possibly five, of these pueblos were known to have been seats or visitas of Franciscan missions during the

<sup>1</sup> See map, p. 36.

<sup>2</sup> The great amount of labor involved in contrast to the meager collections to be obtained from this type of ruin may also have played a part in their neglect.

<sup>3</sup> See Fifth Ann. Rep., Arch. Inst. of America, Boston, 1884.



seventeenth century, while the actual foundation of each one of the eight settlements could safely be referred to a time prior to the arrival of the earliest Spanish explorers. Here, it appeared, was an opportunity to prosecute a piece of research work in the most scientific manner, namely, by working back from the known to the unknown. There was at hand a very considerable amount of published ethnologic data on the Southwest, and investigations of the present Pueblos by Dr. Herbert J. Spinden of the Museum staff and others were in progress. It seemed possible in the light of these earlier findings and with the assistance of modern ethnologists to arrive at sound conclusions regarding the culture, character, and inter-relations of the early historic Rio Grande villagers of the sixteenth and seventeenth centuries, and that much accomplished, the elucidation of the problems presented by the Pueblos of prehistoric times should be an easier task. Work was therefore begun on the Galisteo pueblos.

It is not to be supposed, of course, that the field has been exhausted after six months' labor or that the theoretically or even practically possible has been attained and will be set forth in this report. The mechanical work was made as complete as time and circumstances permitted. But no one ruin was entirely excavated, desirable as that would have been, because even if all the season's effort had been concentrated on the smallest site, the time and means at hand would not have accomplished the purpose. It goes without saying that something valuable could have been learned by such intensive work, but, all things considered, that does not seem to be the great desideratum in the Southwest. The results presented, beyond the mere descriptive details, are therefore in most respects fragmentary and incomplete. Seven of the eight pueblos were excavated to the extent of determining beyond reasonable doubt their historic or prehistoric nature. This entailed the clearance of six separate buildings, the smallest of which contained five rooms and the largest seventy-two rooms, besides the excavation of from one to fourteen more or less scattered chambers in all the other buildings of each pueblo. Altogether 430 ground floor rooms were cleared; but inasmuch as the debris ranged from 1 foot 6 inches to 10 feet in depth and represented in most instances the tumbled masonry of buildings of more than one-story height, the total number of rooms excavated could properly be much increased. Out of these excavations 2385 artifacts of stone, bone, shell, and pottery were obtained; to which might be added 2233 fragmentary artifacts, mostly of stone and exclusive of potsherds. In addition, there were found 257 specimens of the nature of fetiches, comprising quartz-crystals, unused pebbles, oddly shaped concretions, and fossil fragments. Lastly, there were 82 specimens of a less definable nature, such as samples of various kinds of ore, coal, and chalk-like substance. The majority of



the finds, it must be said, consisted of metates, manos, rubbing stones, and the like, common and bulky forms that could not be removed, so that only 1443 actual catalogue entries were made in the field.<sup>1</sup> Something like 23 bushels of potsherds, representing various kinds of incomplete vessels, were unearthed; and from the excavated rooms there were removed about 18 bushels of animal bones, fully three-quarters of the whole amount being taken from buildings occupied in historic times and representing domestic animals. Charred maize was found in all of the ruins, though only once in large quantities. One kiva was cleared and four or five partially excavated, likewise a watch tower. Several trial pits and trenches were dug, some building corners were laid bare to facilitate plotting the ruins, and excavations were made in a number of the refuse heaps both for artifacts and human skeletons. Of the latter 162 finds were recorded, but of that total only 65 more or less complete individual remains were sufficiently well-preserved to admit of shipment. Photographs were taken of all general and special features as the work progressed. Each room was measured and the cleared buildings were plotted on a sufficiently large scale to admit of minor details such as doorways, fireplaces, bins, etc., being shown. Numerous tracings and photographs were taken of the most interesting and typical pictographs in the locality. Finally, in the late fall of 1913, after a very dry summer and when grass and weeds were dead or blown away, i. e., under the best possible conditions, the ruins were mapped with all the care consistent with the nature of the undertaking.

A few words may be added regarding the plan and scope of the work here begun. As there is every prospect that the investigations of the American Museum may continue for some time, it is deemed advisable to reserve treatment of the artifacts and other special as well as general features until such time as most, if not all, of the Tano ruins have been partially excavated. This may require two or three years. The present paper will therefore be limited to a description of the Galisteo ruins and the work done upon them. Reports of a similar nature may follow from time to time as the investigation progresses, and then, when the accumulated data cover the entire Tano territory, and possibly some of the neighboring localities, detailed consideration will be given to all phases of the subject. Meanwhile, in order to work into the situation, as it were, and to discover what some of the archaeological problems really are, it has seemed advisable to preface the report with a

---

<sup>1</sup> After furnishing a few duplicate specimens to some of the owners of the excavated ruins, and making up also a small representative collection for exchange with the Santa Fe Museum, the collections from the Galisteo pueblos to date comprise a total of 1354 entries, besides 82 entries covering miscellaneous collections of potsherds, animal bones, and various surface finds.

brief historical introduction. Though Bandelier performed a great task for the Southwest archaeologist when he in a very scholarly way reviewed the historical data for the region, his general account does not go far enough in certain minor particulars referring to the specific locality here under consideration to serve our needs. The other introductory subject, viz., the environmental aspect of Pueblo culture, while important and interesting, has already been sufficiently treated by Bandelier, Hough, Hewett, Harrington, and others, and may therefore be passed over very briefly.

There remains to acknowledge the Museum's obligation to the owners of the various ruins, namely, Messrs. J. N. Gonzales of Galisteo, Maurice Gomez of Santa Fe, Enrique Varella of Kennedy, and the Hon. Benjamin F. Pankey of Santa Fe. No less than four of the Galisteo basin ruins are located on the large ranch (formerly known as the Eaton Grant) of Senator Pankey, a gentleman who not only gladly permitted excavation but who assisted and encouraged it in every way possible.

The maps and groundplans were drawn by Mr. S. Ichikawa, of the Museum staff, and the tabulated data have been prepared by my wife, who has also assisted in the final preparation of the manuscript.

June, 1914.

## HISTORICAL INTRODUCTION.

## EARLY EXPLORATION.

The Galisteo pueblos appear on the historical horizon as early as 1540 when Europeans entered New Mexico for the first time under the leadership of Francisco Vazquez de Coronado. This splendidly appointed expedition having failed in its main object,—the search for gold,—the vast country explored in the north remained little more than a memory for forty years, when missionary zeal at last opened the way for permanent occupation. Then followed five more or less important entradas in rapid succession and finally in 1598 the actual colonization of New Mexico began.

Coronado was himself indirectly responsible for the later course of events, in that he left two Franciscan friars with a few mostly native followers in New Mexico when he retired from the country in 1542. These missionaries soon became the first martyrs to the Christian cause and the reports which some of their followers brought back to Mexico inspired several individual friars of the same order to enter the far country to continue the work. Evidently little came of these single-handed efforts, as we have neither names nor dates concerning them, but they were not fruitless. In 1581, Friar Augustin Rodriguez, with two brothers of his order, set out for New Mexico under the protection of twelve volunteer soldiers commanded by Francisco Sanchez Chamuscado. They entered the country for the first time by way of the Rio Grande and after some weeks of exploration up this river and through the country to the east the soldiers returned to Mexico alone, leaving the determined friars unprotected among the Village Indians. The precarious situation of these men, alone among unfriendly natives, led to the slightly more pretentious entrada conducted by Antonio de Espejo the following year. Espejo was too late to rescue the friars, but he re-explored practically all the parts of Arizona and New Mexico known to Coronado, became enthusiastic about the country and returned by way of the Pecos River to Mexico to negotiate for royal permission to colonize. Other wealthy men also applied for contracts to settle the new country and several years were consumed by the Crown in considering these propositions which in the end came to nothing. Meanwhile a private colonizing expedition under the command of Castaño de Sosa set out for the north in 1590. He led about two hundred followers up the Pecos River and then crossed to the Rio Grande by way of the Galisteo basin, where he named some of



the pueblos as we know them today. The audacity of entering New Mexico without royal license could, not go unpunished, however, and so while investigating the possibilities of the Rio Grande country a military force commanded by Captain Juan Morlete arrived to put Castaño in chains and to return him with his entire following to Mexico. The last <sup>1</sup> and the least important expedition of the series occurred about the year 1595, when Captain Francisco Leiva Bonilla after a successful military raid along the northern border of Mexico decided, contrary to orders, to enter New Mexico and the buffalo plains beyond in search of Quivira. Reliable particulars are not available regarding this venture, but it seems clear that practically the entire force was massacred by Indians at some point south of Quivira, i. e., roughly speaking, somewhere in east central Kansas.<sup>2</sup> All but the last two of these expeditions visited the Galisteo region and several official reports as well as diaries and personal narratives <sup>3</sup> have come down to us, giving more or less definite information as to the state of affairs in that quarter during the greater part of the sixteenth century. By far the most important of these documents is Castañeda's account of the Coronado expedition which remained in the Southwest for nearly two years and various members of which crossed and recrossed the Galisteo basin many times.<sup>4</sup> It is proper to state that this history was composed more than twenty years after the return of the expedition. But the author had accompanied Coronado and his wealth of definite details compels us to take him at his word that he possessed copious notes. Perhaps he had access also

<sup>1</sup> There is on record a hint of still another rather formidable expedition having been sent from Mexico to Cibola, as the earliest known region in the north was called. The reference occurs in what appears to be an unofficial letter written by one Bartholomew Cano of Mexico to one Francis Hernandez of Seville, and is dated May 30, 1590. The author of the epistle shows himself poorly informed about New Mexico, however, and as no historian has mentioned any such expedition it presumably never took place, even though projected. Hakluyt, III.

<sup>2</sup> See Twitchell, R. E., "Leading Facts of New Mexican History," Vol. I, p. 298, et. seq., also Trans. Kansas State Hist. Soc., Vol. X, pp. 78, 92-93.

<sup>3</sup> Winship, George Parker, "The Coronado Expedition," Fourteenth Ann. Rep., Bur. Amer. Eth., Washington, 1896; or "The Journey of Coronado" in "The Trail Maker" series of A. S. Barnes & Co., New York, 1904.

Testimonio dado en Mejico sobre el Descubrimiento. . . . Fr. Augustin Rodriguez, 1582-3. In Pacheco, Co. de Doc. Ined. XV, 80-150.

Espejo, Antonio de, Relacion del Viaje, etc. In Pacheco, Col. de Doc. Ined. XV; also Hakluyt's Voyages, III.

Castaño de Sosa, Memoria del Descubrimiento. . . . de Nuevo Reino de Leon, 1590. In Pacheco, Col. de Doc. Ined., IV, 283-354; idem. XV, 196-261.

<sup>4</sup> It is assumed here that Coronado's route to Quivira by way of Zuñi, Acoma, Bernadillo, and Pecos, as determined by the labors of Bandelier, Winship, Hodge, Davis, Simpson and others, is correct. F. S. Dellenbaugh, in "Notes on the Location of the Tiguex" (N. Y., 1905), states as his opinion that Coronado crossed New Mexico on a line much farther south; but, after spending two seasons in the country between Santa Fe and Gran Quivira, I am unable to find a route across the uninviting country separating the Rio Grande and Pecos rivers so easy and natural as the one by way of Galisteo. Besides, it fits Castañeda's description in all essential particulars.

to the original official reports. His essential veracity is vouched for at any rate by no less than six brief parallel accounts written by other members of the expedition.<sup>1</sup> But while these seven narratives agree on all main points as to the order of events, the route, the character of the country and of the native inhabitants, it is to be admitted that they are not clear and consistent in many minor particulars, so that we have in the end to fall back mainly on Castañeda for the fullest and most definite statements of fact regarding the Galisteo and related pueblos.

Castañeda (Part II, chapt. 5) writes:—

I wish . . . to give an account of Cicuye (i. e., Pueblo Pecos) and some depopulated villages which the army saw on the direct road which it followed thither, and of others that were across the snowy mountains near Tiguex (i. e., Bernalillo).

He then describes Cicuye in detail, and continues:—

There is a village, small and strong, between Cicuye and the province of Quirex (the Keresan pueblos on the Rio Grande directly to the west), which the Spaniards named Ximena, and another village almost deserted, only one part of which is inhabited. This was a large village, and judging from its condition and newness it appeared to have been destroyed. They call this the village of the granaries or silos, because large underground cellars were found here stored with corn. There was another large village farther on, entirely destroyed and pulled down, in the yards of which there were many stone balls, as big as 12-quart bowls, which seemed to have been thrown by engines or catapults, which had destroyed the village. All that I was able to find out about them was that, sixteen years before, some people called Teyas had come to this country in great numbers and destroyed these villages. . . . The only thing they could tell about the direction these people came from was by pointing toward the north. . . .

There are seven other villages along this route, toward the snowy mountains, one of which has been half destroyed by the people already referred to. These were under the rule of Cicuye.<sup>2</sup>

<sup>1</sup> These parallel accounts have been translated and incorporated by Winship, *op. cit.*, and are entitled:

- (1) Translation of the *Traslado de las Nuevas*.—Anon.
- (2) This is the Latest Account of Cibola and of more than Four Hundred Leagues Beyond.—Anon.
- (3) Translation of the *Relacion del Suceso*.—Anon.
- (4) Translation of the Narrative of Capt. Juan Jaramillo.
- (5) Translation of the Report of Capt. Hernando de Alvarado.
- (6) Translation of the Letter from Coronado to Mendoza, Aug. 3, 1540. Also, Translation of a Letter from Coronado to the King, Oct. 20, 1541.

The first title covers Coronado's Journey only as far north as Cibola or Zuñi, while all the others have more or less to say about the route to the plains, though titles 2, 4, and 5 alone make specific mention of pueblos in what must be supposed to be the Galisteo country. It is to be regretted that some of these accounts, like Castañeda's, were not written until after the return of the expedition. Unfortunately too, there appears to be lost a certain letter of Coronado's mentioned in his letter to the king of October 20, 1541, cited above, and in which the newly discovered provinces on the Rio Grande are said to be described. It is greatly to be hoped that this letter may yet be found in the Spanish archives.

<sup>2</sup> Castañeda is not alone in failing to recognize the Tanos as a distinct group. Captain Alvarado, who was the first man to cross the country between Bernalillo and Pecos, in his



In other words, Castañeda says that in going from Pueblo Pecos westward or southwestward to the Rio Grande they passed first of all, in what we must suppose to be the Galisteo basin, three pueblos, the first (presumably) of which was small and strong; the second, a large village, was new but mostly destroyed and almost deserted; and the third was entirely destroyed. They called the first Ximena, the second Pueblo de los Silos, and the third was characterized merely by the presence of some round boulders lying in the yards.<sup>1</sup> Then, farther on towards the Sandia Mountains, there were near the army's route seven more villages, one of which at least was seen in passing because it is described as being half destroyed. These far from satisfactory statements seem to be corroborated by at least one of the anonymous narrators,<sup>2</sup> who says that during a four days' journey from Bernalillo to Pecos three villages were passed. We quote:—

The first [village] has 30 houses; the second is a large village destroyed in their wars and has about 35 houses occupied; the third about [Ms. illegible?]<sup>3</sup> These three are like those of the river in every way. The fourth is a large village which is among some mountains. It is called Cicuic, and has about 50 houses<sup>4</sup> with as many stories as those at Cibola.

On comparing our two quotations and bearing in mind that the two accounts are given in reverse order they will be found to agree, at least as

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official report (Winship, *op. cit.*, p. 243), mentions seven villages, partly depopulated and partly destroyed, and he evidently considers the regions which they occupied as belonging to the province of Tiguex. His opinion on this point lends substance for the suggestion that he may have passed south of the Sandia Mountains and may have seen or heard of seven Tigua villages on the borders of the Salines, but that is unlikely. The fact that Alvarado saw precisely seven places makes it at first seem plausible that they were Castañeda's seven villages in the snowy mountains, but that also is difficult to believe, as he could hardly have crossed the Galisteo country without seeing some of the settlements there. It is therefore not at all improbable that Alvarado's seven villages correspond to the seven large ruins now located in and about the Galisteo basin. The word Tanos does not even occur in the Coronado narratives, although we easily recognize the modern equivalents of such terms as Chia, Tiguex, and Quirex; and one is inclined to wonder whether the "Teyas," said to have come from the north, may not have been a misapplied term for the Tewas.

<sup>1</sup> Winship, *op. cit.*, p. 104, note 2, says that the second pueblo, i. e., Pueblo de los Silos, was by the historian Mota Padilla called Coquite. Hodge, in his edition of Castañeda, p. 356, note 3, says the same; but on p. 358, note 10, of the same work, and likewise in the *Handbook of American Indians* (Bul. 30, Bur. Amer. Ethn., part II, p. 686) he inclines to the opinion that Coquite was the third pueblo. Bandelier, on the other hand, at least in "The Gilded Man," p. 217, identifies the Coquite of Mota Padilla with Cicuye or Pueblo Pecos, and E. R. Twitchell, in "The Leading Facts of New Mexican History" (1912), Vol. I, p. 243, takes the same view. To judge from the lengthy quotation (note 257) furnished by Twitchell, the identification of Coquite with Pecos is correct.

<sup>2</sup> Winship, *op. cit.*, p. 193; or, 14th Rep. Bur. Amer. Ethn., pp. 567, 570.

<sup>3</sup> Cf. Bandelier's translation and source, *Papers Arch. Inst. Amer.*, Am. Series IV, p. 120.

<sup>4</sup> What this precise author may mean by *houses* is not clear. If he means separate buildings, then the pueblos could not have been collections of large community structures such as characterize the Tano ruins of today; and if he means households or separate family compartments he is contradicted in regard to the population of Pecos by Castañeda (Part II, chapt. 5), who says that Cicuye or Pecos could muster nearly five hundred warriors.

far as they go. The second author merely leaves out of his narrative any reference to the fourth pueblo which Castañeda says was entirely destroyed.<sup>1</sup>

#### IDENTITY OF CORONADO'S GALISTEO PUEBLOS.

Now to establish the identity of these three or four pueblos among the many ruins today scattered over the old Tano territory is next to impossible. In evidence of the difficulty it may be pointed out that Bandelier in the course of his Southwest investigations, and for no obvious or stated reasons, completely reversed his interpretation of the Coronado chroniclers with reference to the subject. Thus, in his earlier writings<sup>2</sup> he accepts Castañeda's epithet "snowy mountains," quoted above, as applicable to the group of peaks and ranges dominated by the Sandia chain, close to Bernalillo; he evidently also believes that Castañeda (see the same quotation) enumerates and describes the pueblos in the order in which they occur from Pecos towards the Rio Grande, i. e., from east to west, and quite naturally therefore identifies Ximena of the Spaniards with San Cristobal of today. But in his Final Report<sup>3</sup> he identifies the same "snowy mountains" with the southern extremity of the Sangre de Cristo range, immediately east of Santa Fe; he reverses Castañeda's order of description and somehow identifies Ximena with Pueblo Galisteo and ends up by declaring himself unable to account for the "seven villages towards the snowy mountains." The identification of Ximena with Galisteo may be correct, and it is so accepted by Hodge, Winship, and other writers,<sup>4</sup> but the fact can hardly be considered as established on the basis of Bandelier's second interpretation of the Coronado records. The precise identity of Ximena is perhaps no vital matter, but the subject as a whole is important, as will appear later, and we therefore ask indulgence for re-examining the original data.

Castañeda informs us (Part II, chapt. 4) that the headquarters of the Coronado expedition was in the province of Tiguex on the banks of a large swift river which flowed through a spacious valley two leagues wide. There

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<sup>1</sup> The other chroniclers are less definite about the number and nature of the pueblos along the Bernalillo-Pecos section of the route. As pointed out already, Alvarado saw seven villages partly depopulated and partly in ruins. He might probably have seen two or three times that number had he looked. Jaramillo recalls only two villages along the route, but his memory fails him on a good many points, though he might easily have passed across the Tano country without seeing any more.

<sup>2</sup> See "Historical Introduction to Studies among the Sedentary Indians of the Southwest," *Papers of the Arch. Inst. of Amer., Am. Series I* (1883), p. 23; also "The Gilded Man" (1893), p. 221.

<sup>3</sup> *Papers of the Arch. Inst. of Amer., Am. Series IV* (1892), pp. 120-122.

<sup>4</sup> Hodge, *op. cit.*, p. 356, note 2; Winship, *op. cit.*, p. 104, note 1.

were twelve native villages in this province, some on one side of the river and some on the other, and the Spaniards occupied one of them (Part I, chapt. 12). This particular village we are led to infer (Part I, chapt. 18) stood on the right or west bank of the river. On the east side of the river was a "very high, rough, snow-covered mountain chain" (Part II, chapt. 4). This mountain chain was *near* to Tiguex (Part II, chapt. 5), and across, i. e., on the farther or east side of it, there were some villages. And finally we are told in three different places (Part II, chapt. 4, 5, and 6) that there were seven of these villages — "four on the plain and three situated on the skirts of the mountain."

For explicitness our historian leaves nothing to be desired thus far. All recent investigators agree that the "large river" could have been none other than the Rio Grande; and nearly all, as previously indicated, are satisfied that the description of Tiguex fits no place so well as the vicinity of the present town of Bernalillo. That Bernalillo *is* the place seems, moreover, established to a certainty by the statement of one of the anonymous chroniclers, who says<sup>1</sup> that the river camp was in the 36th degree of latitude, a reckoning which errs by little more than thirty minutes. This location agrees also very well with the distance and direction of Cicuye or Pecos. Jaramillo expressly tells us that Cicuye was to the northeast of Tiguex;<sup>2</sup> and the distance between the two points we are informed repeatedly by different narrators was from twenty to twenty-five leagues, or a journey lasting from four to five days.<sup>3</sup> The situation of Pecos is also fixed by one of the anonymous writers<sup>4</sup> as being fifteen leagues east of the Rio Grande. These roughly paced distances accord so closely with the actual facts as to surprise us and we may therefore consider Bernalillo and Pecos as two points in the Coronado route fixed beyond dispute. There remains only to decide on the road most probably taken by the Spaniards in going from one place to the

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<sup>1</sup> Winship, op. cit., p. 210.

<sup>2</sup> Winship, op. cit., p. 229.

<sup>3</sup> This, it is true, makes the average daily journey of five leagues or 13.15 miles, seem rather short; but if it be remembered that the Spaniards traveled with pack animals, that the very few watering places were not perhaps most conveniently located, and that they may have stopped to parley at the three or more Indian pueblos along the route, the rate is not at all slow. As a matter of fact Castañeda in Chapter 1 gives us indirectly the highest official opinion to the effect that five leagues per day was all that could be expected for any lengthy journey in New Spain. Castañeda alone sticks to the idea that it was a five day's journey from Tiguex to Cicuye (Part I, chapt. 12 and 19). But as he seems always to have traveled with the main army, which drove and guarded a good many sheep and cattle and thus had possibly to travel more slowly than the ordinary pack train, there is nothing suspicious about his statement. It is also conceivable that the cattle were taken by a less rough but more circuitous route along the Rio Grande to the mouth of Galisteo Creek and thence up that stream bed towards Pecos, but that assumption is weakened by Castañeda's statement in our quotation that the army went to Cicuye by the *direct* road.

<sup>4</sup> Winship, op. cit., p. 205.



other. But before doing this let us revert to the original point at issue, the question of the identity of the "snowy mountains" and the seven villages in them.

There is some reason why Castañeda might have distinguished the high dome-like peaks east of Santa Fe as snowy mountains. In 1912 they were covered with snow early in October, but there were also big patches of white on the Sandia range.<sup>1</sup> Our author has not left his choice in doubt, however. He explicitly says, as has been pointed out, that his snowy mountains were east of and *near* Tiguex. His description of them as "a very high, rough mountain chain" admirably characterizes the Sandias as seen from Bernalillo, but it is not a fitting picture of the Santa Fe Mountains from any point of view. In and about these snowy mountains, he repeats, were seven villages. When therefore, in our second quotation from him, he proceeds to describe the pueblos between Cicuye and Quirex, we are compelled to accept his suggestion that he intends to enumerate and describe the pueblos in the order in which they occur from Cicuye towards the Rio Grande. This understood, the pueblo called Ximena must come first at the east end of the series and the snowy mountains with their seven villages must come last at the west end of the series. That Castañeda was certain about this arrangement is shown in Part II, Chapt. 6, where, in giving a list of the Pueblo provinces ranging from west to east, he places the seven villages in the snowy mountains *before* Ximena. Bandelier's difficulty in accounting for the "seven villages" is thus easily disposed of as he himself reports no less than eight ruined pueblos in the rough country between the Sandia and Ortiz Mountains,<sup>2</sup> and our own investigations add one if not two more sites to the list.

The question of the route taken by Coronado in going from Bernalillo to Pecos has also been considered and in a general way settled by Bandelier. His first opinion<sup>3</sup> was that the expedition passed south of the Sandia range and of the Galisteo basin, directly west to the Rio Pecos and up that river to Pueblo Pecos; but later he concluded<sup>4</sup> that the line of march lay north of the Sandia and across the Galisteo basin, a supposition which has every reasonable argument in its favor. To have gone south of the Galisteo depression would have made the journey excessively long, besides necessitating

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<sup>1</sup> The highest point in the Sandia chain reaches an altitude of slightly over 10,400 feet. Baldy, the highest peak northeast of Santa Fe, is 12,623 feet high, with Lake and Thompson peaks on the south attaining somewhat lesser elevations. The flood plain of the Rio Grande valley itself in this latitude is 5000 feet above sea level.

<sup>2</sup> Papers of the Arch. Inst. of Amer., Am. Series IV, pp. 108-115.

<sup>3</sup> Historical Introduction, etc., Papers of the Arch. Inst. of Amer., Am. Series I, p. 18, note 1.

<sup>4</sup> Papers Arch. Inst. of Amer., Am. Series IV, p. 121. See also a somewhat confused account of this section of Coronado's route in "The Gilded Man," p. 220, et seq.

a march of forty to fifty miles across a waterless plateau. The army, on the other hand, might reasonably, on account of the accompanying cattle and sheep, have passed up the Rio Grande to the mouth of Galisteo Creek and then have followed that stream bed eastward; but that too would have been a circuitous and by no means easy road.<sup>1</sup> Minor detachments of the expedition had previously crossed the Tano country on several different occasions and we may reasonably suppose that various routes had been tried out and that the army followed the best and most direct one, precisely as Castañeda says. Familiarity with the topography aids materially at this point. Nevertheless, to lay down the exact line of march so as to determine beyond all doubt which of the seven or eight Galisteo pueblo ruins were found inhabited in 1641 is quite impossible, inasmuch as the expedition might have passed three settlements on either one of the two very possible routes across the Galisteo basin.

Coronado most probably moved up the Rio Grande to the vicinity of Algodones, then turned northeastward somewhere along the present transcontinental automobile road to the Arroyo del Tunque and followed that stream bed up to Pueblo Tunque, where there is a good permanent spring.<sup>2</sup> Pueblo Tunque is very likely the one of the "seven villages" seen by Castañeda and said by him to be half destroyed and by another writer to have "thirty houses." From Tunque it was possible to strike northeast for the nearest point on Galisteo Creek, or else directly east past the north base of the Ortiz Mountains, straight for Galisteo Creek at Ortiz station; but a road less rough and one affording good grazing, though a little longer, led up the Arroyo del Tunque three or four miles and then directly eastward across a low divide between the Ortiz and San Pedro Mountains on to the extreme southwestern corner of the Galisteo basin, where lie the ruins of Pueblo Blanco.<sup>3</sup> From here the army could have crossed the basin in a northeasterly direction to Pueblo Shé on the other side, continued along the base of the eastern hills either directly to Lamy and Apache canyon or around to the east, past Pueblo San Cristobal and then up the San Cristobal canyon and across the wooded mesa to Pecos. On this latter supposition Pueblo

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<sup>1</sup> On the Galisteo Creek route the Spaniards could not have passed four pueblos as Castañeda says they did. They might perhaps have passed a village now known as Gipuy, the old home of the Queres of Santo Domingo, located on the banks of Galisteo Creek one and one-half miles east of Domingo station; also Pueblo Galisteo and Pueblo San Cristobal, but not Pueblo San Lazaro, without making a detour. It is, however, barely possible that they might have seen the old Tano pueblo called Tze-nat-ay, at La Bajada, to the north of Gipuy and on Santa Fe Creek. This would make the four sites required, but after all they would not be distributed in accordance with the stated notion of Castañeda.

<sup>2</sup> Bandelier, Final Report, Part II, p. 121, suggests that Coronado reached Tunque by way of Placitas, but that is a rough and unnatural route.

<sup>3</sup> This pueblo is called Largo by Bandelier. The reason for changing the name will be considered later.



San Cristobal might be regarded as Castañeda's Ximena, Pueblo Shé would be the village referred to by him as new and large but partly destroyed, and Pueblo Blanco would be the village said to have been entirely destroyed. There are two superficial circumstances, however, which suggest another transit of the Galisteo basin. In the first place the prehistoric part of Pueblo San Cristobal is very large<sup>1</sup> and the natural position cannot be said to be strong, so that it is probably not the Ximena specifically characterized by Castañeda as "small and strong." The second point is more interesting because of a positive nature. It will be remembered that Castañeda in referring to the westernmost of the three Galisteo pueblos (see quotation), i. e., the one totally destroyed, remarked about some curious stone balls lying about in the yards and supposed by him to have been in some way employed by attacking enemies in destroying the village. While at work in the Southwest and before becoming fully conversant with Castañeda some such stone balls were noticed at Pueblo San Lazaro, not in the yards of the ancient pueblo to be sure, but along the base of the sandstone escarpments in the vicinity. No particular attention was paid to them at the time, but later, on reading Castañeda, these peculiar spherical concretions at once came to mind, as they were observed nowhere else. The coincidence is not in itself sufficient to establish the identity of Castañeda's third pueblo, seen on the road from Pecos towards the Rio Grande; nevertheless, it appears to be about the only positive hint or clue that we have pointing to Coronado's line of march.

Pueblo San Lazaro is so located that Coronado would hardly have passed it by taking any one of the two or three rather difficult routes leading north of the Ortiz Mountains. To see the pueblo he would have had to make a special detour to the south from Galisteo Creek. But if the expedition came, as seems most likely, by way of the pass between the Ortiz and

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<sup>1</sup> In this connection it may be well to point out that the author of the *Relacion del Suceso* (Winship, op. cit., p. 205) in speaking of a village larger than all the rest, which he calls Cicuique (supposed to be the Cicuye of Castañeda, i. e., Pueblo Pecos), says that its buildings have four or five stories and the village has *eight large courtyards*. Also, Jaramillo (Winship, op. cit., pp. 228-29) when referring to the villages situated on the Rio Grande tributaries mentions, among others, this same Cicuique, which he says has two-story houses. It is true Jaramillo may have learned from the Indians, as did Castañeda, that the Pecos River flowed into the Rio Grande, but he seems to distinguish between the stream on which Cicuique is located and the river Cicuique, three days' march from the pueblo. It will be noted that the two writers are not agreed as to the height of the buildings of Pueblo Cicuique, partly, no doubt, owing to the fact that Jaramillo wrote after his return to Mexico and had only his memory to rely upon. Still he ought to have remembered the trend of the stream passing one of the three to him most notable pueblos, and one wonders whether these two writers did not perhaps by mistake apply the name for Pueblo Pecos to Pueblo San Cristobal, a village the ruins of which show today even more than eight large courts whereas Pueblo Pecos itself does not seem to have had that many. The evident confusion here may possibly be cleared up some day when the pueblo of Pecos is evacuated.

San Pedro Mountains, it could, after crossing that divide, instead of continuing east to Pueblo Blanco as first suggested, have turned to the northeast and have come down on Galisteo Creek at Ortiz station by way of the Arroyo del Chorro. In making this turn the army would have passed Pueblo San Lazaro about two miles south of Galisteo Creek. A short distance above this point the creek in question splits up into several branches which may or may not show running water at all times of the year. The San Cristobal branch has a nearly permanent flow but it continues directly east and is not the easiest route for Pecos. The Galisteo branch turns to the northeast and passes the ruins of Pueblo Galisteo about two miles above its confluence. From here the stream channel can be followed past what is now Lamy Junction up into Apache canyon to the Glorieta divide, from which another passable canyon may be followed directly southeast to Pueblo Pecos, the route being practically that followed by the Santa Fe railroad all the way from Ortiz to Decatur.

If now we identify Castañeda's totally destroyed village as Pueblo San Lazaro of today, and his half destroyed village, called by him Pueblo de los Silos, as Pueblo Galisteo, we are still at a loss for his village named Ximena. Ximena is described as small and strong, a characterization fitting neither Pueblo San Cristobal nor Pueblo Galisteo, if situations and present indications of the size of the ancient ruins are to be taken into account. But if Ximena is to be identified with either San Cristobal or Galisteo it must be with the latter, because one of the smaller buildings of Pueblo Galisteo is located on a high and easily defended rocky spur. There are, however, certain traces of minor settlements on the banks of Galisteo Creek between Pueblo Galisteo and Lamy. Those sites nearest Lamy, i. e., within a mile or so southeast of the station, appear to be very ancient and were probably so in 1540; but farther down the stream, about two miles above Pueblo Galisteo itself, there is a place (recently abandoned by Mexican settlers) called Colorado, which shows some signs of having been a former Indian habitation. It was a small village and it may also be said to have occupied a strong position in the sense that it lay out in a broad barren plain. To furnish proof that this site is Ximena is not possible; it may have been merely a collection of summer houses belonging to the people of Pueblo Galisteo. Still the place comes nearer to fitting Castañeda's description than either San Cristobal or Galisteo, which pueblos Bandelier chose at different times as the possible Ximena.

In short, after all has been said that can be said, we are not able with certainty to identify the three Galisteo pueblos which Castañeda partially describes for us. At best we may say that Pueblo Tunque, Pueblo San Lazaro, and Pueblo Galisteo are so distributed and bear certain faint marks

such as to suggest their identification. Ximena may conceivably be Pueblo San Cristobal, but all the circumstances point to some other small site, perhaps near Lamy, on the more direct and natural route to Pecos. On the whole, the most satisfactory result to be obtained from a study of the Coronado records is the more or less indirectly conveyed impression that the large Galisteo pueblos, with two or three exceptions, were already abandoned and in ruins before the middle of the sixteenth century, and that the bulk of the Tano population was, perhaps only temporarily, concentrated in the mountainous country on the extreme southwestern border of their old territory. Bandelier comes to about the same conclusion in his Final Report,<sup>1</sup> and he strengthens his case by citing a Keresan folk-tale to the effect that before the arrival of the Spaniards there swept in from the plains some enemies called Kirauash who ravaged the Pueblo country as far west as the Rio Grande. Castañeda, it will be remembered, says that the Teyas destroyed the Galisteo pueblos sixteen years before, i. e., about 1525. The opinion is ventured by Bandelier that Castañeda erred about the identity of these destroying enemies, that they were not the Teyas but the Querechos, probably identical with the legendary Kirauash and in reality Apache. However that may be, there is little room for doubt that Castañeda knew of all the inhabited Galisteo pueblos, excepting perhaps San Marcos, which was somewhat off the route and well hidden. The country in question was crossed by various parties of the Coronado force at least nine different times and probably by different routes, so that it is not unlikely that nearly all of the present known Galisteo ruins were seen, or at least heard of, by some members of the expedition. Alvarado's report<sup>2</sup> that he saw seven depopulated and destroyed villages in these parts strongly points to the fact that he at least had circled the entire Galisteo basin. We may therefore close this part of the investigation by repeating that the Galisteo pueblos, with two and possibly three exceptions, appear to have been already abandoned prior to 1540, and that as nearly as we can judge the former inhabitants had retreated to the rough country lying between the Ortiz and Sandia Mountains.

#### GALISTEO PUEBLOS MENTIONED BY LATER EXPLORERS.

If now the records of the succeeding explorers were in the same readily accessible shape as those relating to the Coronado expedition, they would call for an equally critical examination in order to determine what took

<sup>1</sup> Papers Arch. Inst. of Amer., Am. Series IV, pp. 115-123.

<sup>2</sup> Winship, *op. cit.*, p. 243.



place in the Galisteo country before the introduction of the Spanish régime in 1598. As it is, such treatment must be left to some future date and we shall have to content ourselves with a brief summary of current facts and opinions on the subject.

The second expedition to enter New Mexico, in charge of Captain Chamuscado and Friar Rodriguez, appears to have found Coronado's Tiguex. From near that place the party crossed the Rio Grande and followed one of its branches eastward to the buffalo plain, finding three villages along the way, whose inhabitants told them of eleven more settlements.<sup>1</sup> There seems to be nothing in the way of our believing that the three observed villages were Castañeda's two Galisteo pueblos together with Pueblo Pecos, but we receive no hint as to where the other eleven villages may be, unless it is from the next succeeding explorer.

The third expedition, under Espejo's command, accomplished a great deal, but the second-hand fragment of the record most familiar to us unfortunately does not inspire confidence.<sup>2</sup> However, it seems that Espejo also found Coronado's old headquarters at Tiguex and that he identified the place as such.<sup>3</sup> From here he journeyed east and within two days found himself in a province of eleven towns belonging to a people whom he calls Maguas or Magrinas. The region bordered on the buffalo country, was fertile, and gave evidence of being rich in mines. As little more than a year had elapsed since Chamuscado was in the country, it is only natural to suppose that Espejo's eleven towns were the same eleven towns heard of by his predecessor, and the circumstances about the mines and the distance of two days' journey or less from Tiguex suggest that probably these are Castañeda's seven villages and some additional settlements to the south, along the east base of the Manzano Mountains. At any rate, they could hardly have been Galisteo villages, because later on Espejo traveled twelve leagues east from a point farther up the Rio Grande and came to the province of the Hubates, from which place he reached the country of the Tamos, or Tanos, in one day. Rich mines were discovered in the Hubates country, which is described as having many mountains covered with pines and cedars, and must unquestionably be identified with the region of Santa Fe. In the Tamos country Espejo found three pueblos, of which Pecos was one, the other two being presumably the two Galisteo pueblos known to Castañeda and probably also to Chamuscado. There is room for difference of opinion, however, in regard to much of the foregoing, as will be made evident by

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<sup>1</sup> Twitchell, *op. cit.*, I, 257 et seq.

<sup>2</sup> Hakluyt Voyages, Vol. III.

<sup>3</sup> See Hodge, *Handbook of American Indians*, p. 313, under Puaray; also Twitchell, *op. cit.*, I, 275.

consulting the writings of Bandelier, Hodge, and others. For example, in reference to the Tano province alone, Espejo estimated the population at 40,000, and even if we allow for his evident exaggeration we are not forced to suppose that he intended to convey the idea that all the Tano people were housed in just three villages.

However that may have been, when the fourth expedition, or rather colonizing party, led by Castaño de Sosa, arrived in the Galisteo country eight years later there is some evidence of a change. Castaño came up the Pecos River to Pueblo Pecos, near which he established a temporary camp. From that place he went forward with a special expedition across the mountains and proceeded north apparently as far as Pueblo Taos, came down the Rio Grande (which he named) as far as the Queres province, and then returned to Pecos by way of the Galisteo country, where he passed and named the pueblos of San Marcos, San Lucas (later Pueblo Galisteo), and San Cristobal. Shortly after he moved his headquarters to San Marcos and a little later on to Santo Domingo. While at San Marcos some of the party one day visited another pueblo, two leagues distant, which conceivably may have been San Lazaro, but was more likely the pueblo of Tzi-gu-ma, at Cienaga to the north of the Cerrillos peaks. A few weeks later, while on a prospecting trip in what was probably the Ortiz and Sandia Mountain country, Castaño found two more pueblos, both of which had been abandoned, but the seven, and later on, eleven villages known to earlier explorers in that region are not mentioned.

In view of the facts that Castaño's expedition was recalled and that Oñate did not arrive until seven years later, it becomes interesting to know how the place names given by the former explorer came to stick, and whether after all, the pueblos San Marcos and San Cristobal of today are the identical sites so named in 1591. Prince<sup>1</sup> thinks they are not, whereas Bandelier<sup>2</sup> takes the opposite view. There is nothing impossible about it, however. Oñate may have had a copy of Castaño's diary with him, or he may have had a number of Castaño's followers along who could re-locate the valuable mining prospects and identify every landmark.<sup>3</sup> Still how comes it that the names San Marcos and San Cristobal should have been retained while the name San Lucas, supposed to have been applied to Pueblo Galisteo of a later day, was changed?

Accepting Bandelier's opinion as entirely probable, we seem at first sight to be confronted with a new situation regarding the number and distribu-

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<sup>1</sup> Prince, L. Bradford, "A Concise History of New Mexico" (1912), p. 89.

<sup>2</sup> Papers Arch. Inst. of Amer., Am. Series IV, p. 93; p. 101, note 1; p. 104.

<sup>3</sup> Twitchell, *op. cit.*, I, p. 313, says that Oñate found near Bernalillo two Mexican Indians who had been left in the country by Castaño and who served Oñate as interpreter.



tion of the Tanos. On the one hand Castaño did not see or hear of the "eleven towns" noted by two of his predecessors in the Ortiz and Sandia Mountain region, and on the other hand he found some new pueblos inhabited in the Galisteo country. But, as to the first point, we are not forced to conclude that Castaño examined the entire mountain region in the Tano territory. The fact that he mentions two and only two abandoned pueblos seems to indicate that his survey was limited or he would surely have found several more sites, either abandoned or inhabited. With reference to the Galisteo country the noted change may likewise be more apparent than real. There is no evident proof that any of the previous explorers from Coronado on down found more than two inhabited villages in the Galisteo basin proper, possibly the very two which Castañeda named Ximena and Pueblo de los Silos. Ximena originally was small but may have grown during the half century interval, and the other village, nearly ruined in 1541, may have been rehabilitated, if not enlarged. That something of the sort took place seems a warrantable inference from Espejo's statement about the great population of the Tanos-Pecos province.

When Castaño comes on the scene he names the two Galisteo settlements San Cristobal and San Lucas and adds a third village, namely, San Marcos. As has been stated before, it is not impossible that Pueblo San Marcos had existed for some time prior to Castaño's arrival, if not already established in Coronado's time. The place is situated, as it were, in the middle of a triangle, the three sides of which it was natural for the Spaniards to travel ordinarily while there was little occasion for them to cross over the center where San Marcos lay hidden.<sup>1</sup> Castaño, unlike his predecessors, came with a wagon train and was obliged to seek out a suitable road by which to cross from Pecos to the Rio Grande, and he could have found none better than the one over the rolling plain, say from Pueblo Galisteo around the north end of the Cerrillos uplift, on which route he would have come close to San Marcos. The antiquity of San Marcos is, however, only a suggested possibility; superficial examination of the present ruin reveals no hint of long occupancy, such as is plainly evident at Pueblo San Cristobal for instance. The additional village, not named by Castaño but said to be situated two leagues from San Marcos, we may fairly assume to have been at Cienega because San Lazaro is considerably farther away. We need not, therefore, of necessity suppose that any of the old ruined pueblos in the Galisteo basin proper had been resettled during the fifty years since Coronado's day, though at the same time we must doubtless allow that the two

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<sup>1</sup> It is conceivable, of course, that San Marcos was one of the five Hubates villages mentioned by Espejo in 1583.

pueblos seemingly present there since 1541 had grown to some dimensions. And inasmuch as Castaño calls these two villages San Lucas (i. e., Galisteo) and San Cristobal, we may also have to admit that Ximena and San Cristobal are, after all, one and the same, in spite of the fact that no really positive proof exists to that effect.

To sum up the situation: on the basis of the meager evidence at hand it seems most plausible to suppose (1) that San Marcos and perhaps the village of Cienega, as well, were pueblos founded after Coronado's visit but some time before Castaño's arrival; (2) that the two Galisteo pueblos, San Lucas and San Cristobal, had been rehabilitated since 1541; and (3) that the suggested increase of the Tano population in the Galisteo country corresponds to the similarly suggested decrease of inhabitants in the region of the much talked of seven or eleven pueblos between the Ortiz and Sandia Mountains. In other words, the majority of the Tanos who in the second quarter of the sixteenth century sought protection in the mountainous portion of their territory, had once more returned to the open plain country where lay scattered the large ruined villages of their forefathers.

Fortunately, what follows of the history of the Tano pueblos, though meager, is a little clearer and less subject to conjecture, so that we can pass over it rapidly. Meanwhile, it may be well to state that a careful study of the various accounts of these early explorers by someone thoroughly familiar with the topography in question and also with the situation of the ruins would be productive of valuable results.

#### THE TANOS UNDER SPANISH RULE.

The time had finally arrived when Spain could no longer delay the actual colonization of New Mexico, and the man to win the coveted right to the honors and emoluments of this great enterprise was Don Juan de Oñate. After elaborate preparations, this energetic leader entered the country at El Paso in May, 1598, and before the end of the year he had by tactful and peaceable means obtained the submission of all the principal pueblos, excepting Acoma where force was made necessary. He next divided the entire country into seven mission districts,<sup>1</sup> the Galisteo pueblos being grouped either with Pecos or, as Bancroft seems to think, with the Queres on the Rio Grande.<sup>2</sup> In connection with this apportionment various

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<sup>1</sup> See Twitchell, *op. cit.*, I, 313-14, and note 317, which is a quotation from Palacio, tomo II, Mexico, *Traves de los Siglos*, p. 456.

<sup>2</sup> See Twitchell, *op. cit.*, I, p. 321 et seq., note 327, quoting condensed lists of the Pueblo tribes and settlements from Bancroft's (H. H.) "History of Arizona and New Mexico." Bancroft collected these names from the records of Oñate's conquest, chief of which is the *Obediencia y Vassalaje* in the Pacheco Docs. XVI, and also from the *Historia de Nuevo Mexico*, Alcala, 1610, by Gaspar de Villagra.

lists of recognizable tribal names appear, such as Jemez, Queres, Tewa, and Tigua, but strangely enough the designation "Tano" is not among them. Likewise, though we find such village names as Pecos, Taos, Picuris, Sia, Abo, and even the names of three or four towns ultimately identified by Bandelier as Tano pueblos and located in the Ortiz-Sandia Mountain country,<sup>1</sup> the Galisteo pueblos are not mentioned, that is not by their later known Indian names. San Marcos may be an exception to this statement, inasmuch as Bandelier has identified the designation "Yates," given in the conquest documents, with the present Queres name Ya-tze for that settlement.<sup>2</sup> The name San Marcos also occurs, however, and somewhere near it is mentioned Cienega de Carabajal, undoubtedly the unnamed pueblo referred to by Castaño de Sosa as being two leagues distant. San Cristobal is given but not San Lucas, the name Santa Ana being apparently substituted here for a short time.<sup>3</sup>

The legitimate inference seems to be that whether the Tanos were actually confined to Cienega, San Marcos, Galisteo, and San Cristobal, or in addition held three or four minor settlements over towards the Sandias, they were not in any sense a prominent people. Their numerical strength in 1598 can only be guessed at. No census figures became available until along towards 1630, when Fr. Alonzo de Benavides reported to the king that there were in New Mexico over 60,000 native converts living in ninety villages, each of which had its own church.<sup>4</sup> He groups the settlements somewhat according to the languages spoken and says that the Tanos occupied five pueblos and numbered 4,000 souls. But whether the invariably round numbers of Benavides are conscious exaggerations or not, there is some reason for believing that he may have erred with regard to the Tanos. The difficulty lies partly in the determination of their five pueblos. San Cristobal and Galisteo, it is conceded by all investigators, were two of them. San Lazaro may have been a third, though no one has cited positive proof that this place was resettled prior to 1630, or even a much later date. The pueblo of Paako, over beyond the Ortiz Mountains, may have been a fourth settlement, as Bandelier finds it to have been inhabited as late as 1626, and

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<sup>1</sup> These pueblos are Ojana, Quipana, Puerto (or Tuerto) and Paako. Bandelier is uncertain as to whether or not these settlements were inhabited in 1598. (See *Papers Arch. Inst. of Amer.*, Am. Series IV, p. 108, et seq.) Oñate learned the names from the Tewa at San Juan and he may not actually have seen the places.

<sup>2</sup> *Papers Arch. Inst. of Amer.*, Am. Series IV, p. 92.

<sup>3</sup> *Papers Arch. Inst. of Amer.*, Am. Series IV, p. 101.

<sup>4</sup> Benavides' Memorial was published in Madrid, 1630. See substance of this report in Twitchell, op. cit., I, 342-43; Prince, op. cit., p. 47; or Bul. 30, Bur. Amer. Ethn.

Twitchell, on pages 338-40, cites figures of another, perhaps an earlier report by Benavides, which gives 500,000 gentile converts, 86,000 baptized, 150 pueblos, and adds the statement that the population was rapidly increasing.



in his opinion by the Tanos, though the evidence is contradictory.<sup>1</sup> As nothing is known of Paako, however, after 1626, it is conceivable that the settlers, if actually Tano, were moved about that time, perhaps to San Lazaro, for protective and missionary purposes. Bandelier also suggests that Pueblo Blanco, or Largo as he calls it, may have been one of the five sites wanted, but that, we may say by way of anticipation, cannot have been the case. There remains, therefore, at least one and probably two villages to be accounted for and these are supplied by San Marcos and Cienega. Bandelier, after examining the conflicting historical and traditional testimony showing that these two pueblos were inhabited probably by both the Tanos and the Queres, finally yields to the idea that they were Tano.<sup>2</sup> Under these circumstances Benavides may unintentionally have included a large number of Queres in his 4,000 Tanos. Bandelier himself thought that number excessive.<sup>3</sup> Consequently, if we bear in mind that the Tanos had lived for at least a generation under conditions of comparative peace and plenty and had no doubt increased rapidly, we cannot fail to discern their numerical weakness in 1598. If this is not the correct view of the situation, one is at loss to understand what had become of the Tanos in 1680 when the most liberal estimate of the population could hardly have exceeded 3,000 individuals.<sup>4</sup>

But whatever the distribution of the Tanos may have been in 1598 and 1630, there is no doubt that in 1680, on the outbreak of the successful Pueblo Rebellion, they were concentrated in the Galisteo country with their chief mission located at Pueblo Galisteo, that being the most central village of the group. Their relative weakness at this time is also indicated by immediately subsequent events. As is well known, the Tanos from Pueblo Galisteo and probably also those from San Marcos and Cienega (if indeed there were any) entrenched themselves in Santa Fe shortly after the retreat of the Spaniards, thus leaving San Cristobal and San Lazaro as exposed outposts. These two settlements were over ten miles apart and their positions became insecure when, soon after, internal dissension arose among

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<sup>1</sup> Papers Arch. Inst. of Amer., Am. Series IV, pp. 113-14.

<sup>2</sup> Papers Arch. Inst. of Amer., Am. Series IV, pp. 92-93.

<sup>3</sup> Papers Arch. Inst. of Amer., Amer. Series IV, p. 107, note 1.

<sup>4</sup> This estimate is based on knowledge of the size of some of the historic Tano ruins, together with Vetancurt's statement (see Bandelier, Final Report, II, 92, note 4) that San Marcos had 600 inhabitants and San Cristobal 800 (Final Report II, 103; also Twitchell, I, 352). Bandelier, on the same page, makes the statement that Pueblo Galisteo at about this time (1680) may have had over 1000 inhabitants and Twitchell (op. cit. I, 359, note 368) repeats it. Hodge, however, (Handbook of Amer. Indians, II, 325) suggests that the number 800 cited above for San Cristobal may have included the inhabitants of both Galisteo and San Cristobal. If this is correct, and if perhaps San Marcos and Cienega were settled mostly by the Queres, then the Tanos may well have numbered less than 2000 souls, which makes the apparent error of Benavides all the more pronounced.

the Pueblos and when the Queres and Pecos Indians became actively hostile towards both the Tewa and their close kin, the Tanos.<sup>1</sup> The Apache, who only a few years before had destroyed all the Piro and Tigua villages bordering the Salines on the south, also made their appearance at this time and it seems practically certain that these ancient and terrible foes, together with the Pecos and perhaps the Queres, at last forced the abandonment of both San Cristobal and San Lazaro. The inhabitants at any rate moved north of Santa Fe into the Tewa country, where they founded separate homes about three leagues from the pueblo of San Juan, or, as later determined, near the present village of Santa Cruz.<sup>2</sup> Here Diego de Vargas found them in 1692 and received their peaceful submission.<sup>3</sup> But early in 1694, after De Vargas had seemingly annihilated their Galisteo brethren for refusing to evacuate Santa Fe,<sup>4</sup> they once more broke forth and followed the Tewa in retreat to the Black Mesa of San Ildefonso. From this stronghold the confederates made raids occasionally as far as Santa Fe. Here also they withstood assaults and siege but were finally, after nine months, compelled to sue for peace and to reoccupy their villages. The following year the San Cristobal and San Lazaro Indians again left their homes and sought the hills, but finding themselves unsupported by their Tewa neighbors they soon returned. At last, in 1696, whether owing to a threatening famine or to fear of the Spaniards' revenge upon them for taking part in the general uprising of that year,<sup>5</sup> the majority of the Tanos, together with some Tewa, appear to have fled west, mostly to the Hopi country, where their descendants still live.<sup>6</sup>

<sup>1</sup> See quotations from Escalante and from the *Relacion Anonima* in Twitchell, op. cit., I, 359; or Bandelier, *Final Report*, II, 103, note 2. Prince, op. cit., p. 51, says that the Queres and Tewa united and almost destroyed the Tanos and Tiguas, but that can hardly have been the case as he later tacitly admits on p. 116.

<sup>2</sup> Bandelier, *Papers Arch. Inst. Amer.*, Am. Series IV, 83, p. 103, note 2.

<sup>3</sup> Bandelier (preceding cit., 83) says that these new settlements were known by the same names as the old homes left in the Galisteo basin, viz., as Yam-p-hamba (San Cristobal) and I-pe-re (San Lazaro). De Vargas evidently also transferred the old Spanish names, because the two new pueblos are referred to several times later on as San Lazaro and San Cristobal.

<sup>4</sup> The chief occupants of Santa Fe during the twelve or thirteen years of the rebellion were, it will be remembered, the Tanos from Pueblo Galisteo. With them may have been a few Tanos from San Marcos and from Cienega; and there were evidently also some Tewa in the place, at least in 1693. (See quotation from the journal of De Vargas in Twitchell, op. cit., I, 389). The San Marcos people had agreed in 1692 to return to their pueblo, which was already in ruins; but whether they did so is not clear, nor is it at all certain that they were Tanos and not Queres and were actually entrenched with their Galisteo tribesmen in the old capital city. Twitchell (op. cit. I, 393) relates that De Vargas in retaking Santa Fe killed eighty warriors and sold four hundred surviving women and children into slavery. This catastrophe probably ended the group life of the Galisteo people, as it is not stated that the later settlers of the old pueblo were members or descendants of that group.

<sup>5</sup> In this uprising the Tanos of San Cristobal killed their priest, Fray Jose de Arvizu, on the 4th of June. (Bandelier, *Final Report*, II, p. 83).

<sup>6</sup> No documentary proof has been found cited by the historians who record this migration to the west, but the fact is hardly to be doubted because Bancroft (op. cit., p. 229) states



The tribal existence of the Tanos in the Rio Grande country was not yet at an end, however. The great rebellion, in which they were always active, had well-nigh proved their undoing, but a few households remained and these seem to have found asylum at the Tewa pueblo of Tesuque. At any rate, in 1706, Governor Cuerdo transferred a remnant of Tanos consisting of eighteen families (90 individuals) from Tesuque to Galisteo.<sup>1</sup> Whether these Indians were former residents of this or of some other Tano pueblo is not made evident, nor is it clear that the new settlement was made on the site of the old ruined pueblo and not at some other place in the neighborhood, as, for example, on the spot where the Mexican town of Galisteo now stands. Wherever the settlement was, it continued to exist for nearly a hundred years, the object of some solicitude on the part of several of the New Mexican governors because, like Pecos, it was subject to repeated attacks by the new Pueblo scourge, the Comanche. Epidemics of smallpox also ravaged the settlement towards its latter end, so that while the pueblo appears to have grown and prospered during all of the first half of the eighteenth century, it declined rapidly from about 1750 onward.<sup>2</sup> There are, however, only a half dozen pertinent historical and documentary references to the place for the entire period of its existence and these cease altogether in 1794, at which date the last remnant of the Tanos had moved to the pueblo of Santo Domingo, where their idiom is still spoken by a few individuals.<sup>3</sup>

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that in 1706 the Tanos and others came to the assistance of the Tewa pueblo of Tusayan in forcing a retreat of the Spaniards and their Zuñi allies. The fact seems to be that there was a general exodus from the Rio Grande country during the years of the rebellion — or more strictly from 1680 to 1696 — not only of the Tanos and Tewa but of the Jemez and Tigua as well. Thus in 1696 the Jemez fled to the Navajo country where they remained for several years (Twitchell, *op. cit.*, I, 410), and in 1743 the Franciscan missionaries brought back to the Rio Grande 441 Tigua, who, prior to the revolt, had lived in the pueblos of Sandia, Alameda, and Pajarito (Twitchell, *op. cit.*, I, 439).

<sup>1</sup> Twitchell, *op. cit.*, I, 422; also Bandelier, *Final Report*, II, p. 102, note 2; Prince, *op. cit.*, 123. The name of the settlement was changed at this time to Santa Maria de Galisteo.

<sup>2</sup> Bandelier (*Final Report*, II, p. 102, note 2) indicates the course of rise and decline by citing the population at different dates as follows; 90 original settlers in 1706, 110 individuals about 1712, 50 families (Bancroft gives 350 individuals) in 1748, and 52 individuals in 1782.

<sup>3</sup> Hodge (*Bul. 30, Bur. Am. Ethnol.*, II, 325) places the date of the abandonment of Pueblo Galisteo somewhere between 1760 and 1805. Bancroft (*op. cit.*, and quoted by Twitchell, *op. cit.*, I, 455) appears to give 1760–1798 as the limiting dates, owing largely to the fact that Galisteo became a visita of Pueblo Pecos and the populations of the two villages are merged from 1760 onward. But Prince (*op. cit.*, p. 33) states that Galisteo was dropped from the mission reports of the Indian population for the years 1796 and 1798, which practically corroborates Bandelier's view, followed in the text above. It may be remarked that the fate of the Tanos of Galisteo was the experience also of their near neighbors at Pueblo Pecos. This strong village, which in 1680 numbered 2000 souls, was likewise decimated by Comanche attacks and by disease until finally in 1838 its remaining seventeen individuals withdrew to their kinsfolk at Jemez.

## SUMMARY AND CONCLUSIONS.

The Galisteo basin was the last permanent home of the Tanos, a Pueblo tribe closely related culturally and linguistically, and doubtless racially as well, to the Tewa who still live on both sides of the Rio Grande north of the Santa Fe latitude. The Tano country was not limited to the Galisteo basin, however. From prehistoric times it appears to have included considerably more than the entire Galisteo watershed and to have extended, roughly speaking, from Santa Fe on the north to beyond the southern limits of the Galisteo depression, a distance of fully thirty miles, and from the Rio Grande-Pecos divide westward almost, if not quite, to the Rio Grande, i. e., about forty miles from east to west. In other words, the Tanos controlled about 1200 square miles of territory made up partly of barren plains and partly of forested mesas and mountains, the latter of which contained valuable turquoise mines and have since been found to be fairly rich in gold, copper, and coal. Its agricultural facilities were not to be compared with those of the Rio Grande valley. Still there were offsetting advantages; timber and building stone were near at hand, sheltered spots were more easily secured, game was probably more plentiful, and water was by no means lacking; so that, taken all in all, for a primitive, sedentary people it was a country not to be despised.

Scattered over this territory, Bandelier enumerates twenty-eight ruins, besides evidences of small houses, grottoes, and minor vestiges.<sup>1</sup> Some of these sites this distinguished investigator examined in person, but many others he reported on hearsay and their existence remains in some instances to be substantiated. The present investigation does not as yet embrace an exhaustive search, but the majority of the places mentioned by Bandelier have been located and examined; and while it has not been possible thus far to find, e. g., the Dyapige and Uapige pueblos said to lie in the mountains southeast of Lamy, several other minor sites have been discovered so that Bandelier's total will probably in the end be increased rather than diminished.

Now it is not to be supposed that these twenty-eight or more Tano villages were occupied simultaneously. To do so is to assume a population out of all proportion to the known historical facts about the Tanos and about the Pueblos of the Southwest as a whole. The preceding account goes to show that since 1540 the Tanos probably never occupied more than nine or ten settlements at any given date and these settlements, in view of the

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<sup>1</sup> Final Report, II, pp. 87-124.

known limits of the total population in 1630 and 1680, must have been relatively small, averaging no doubt considerably less than 300 individuals all told for each pueblo. By 1630 the Tanos had been concentrated into five villages and numbered — after thirty years of peace and plenty — at most 4000 souls. But this figure, as has been shown, must unquestionably be reduced, because in 1680 the population did not exceed 3000 and may have been less than 2000. In contrast to these figures it must be pointed out that the eight Galisteo pueblos alone could have housed certainly more than 10,000 people, or over 1000 inhabitants for each village. Furthermore some of the outlying Tano ruins are as large as those of the Galisteo basin itself and there is no reason to doubt that all the large pueblos were for a time at least permanent settlements and not merely summer villages for seasonal occupancy. We seem therefore to be forced into a dilemma where we are compelled to suppose either that the desperate Teyas, of whom Castañeda informs us, slaughtered or took captive the Tanos by wholesale or that the Tanos have lived in their late territory for several milleniums. Neither of these conclusions is plausible, but if great slaughter did take place it will doubtless become evident in the course of the archaeological investigation. The chief objection to the idea of a lengthy occupation of the region by the Tanos lies in the uniform nature of the glazed pottery scattered over the large sites, and the fact that there are evidences within the same territory of a preceding people who built small villages and single-room houses and who made unglazed pottery exclusively. In the face of these seemingly contradictory and irreconcilable historical and archaeological evidences, what appears to the writer the most reasonable solution is that the Tanos never numbered more than three or four thousand individuals, and that though a sedentary, agricultural people, they shifted from time to time as nature and circumstances compelled. Likewise it is regarded as probable that these large pueblos were not at any time occupied to their apparent capacity, but that while new buildings were being added at one extremity of the village, old structures were falling into ruins at the other. In other words, while the period of time elapsed since the Tanos arrived in the Galisteo region must be taken as relatively limited, it is nevertheless necessary to suppose that the numerous large ruined villages left by them were occupied successively, or that, in short, some of the sites are older than the rest.

A number of points and problems have now been forced to the surface and we may close this preliminary study by simply indicating what some of the objects of the archaeological investigation must be. In the first place, it will be important to determine the five or more historic Tano pueblos, to fix their capacity and to correlate their combined probable population with

the early historic census. Secondly, it will be imperative to locate all the prehistoric Tano ruins, to determine their size, the relative duration of their occupancy, their relative antiquity, and the relation, if possible, of the oldest sites to the preceding small pueblos. There are, of course, also the wider problems touching the absolute antiquity, the permanent or changing culture and character of the people in question, their relation to neighboring tribes, etc., but these need not be formulated at the present time.



## DESCRIPTION OF THE GALISTEO BASIN.

The Galisteo basin has been described by Bandelier, but in the language of Espejo, as a bleak and arid waste, having neither rivers nor brooks nor springs, and at the same time as a country abundantly supplied with maize, wild turkeys, etc.<sup>1</sup> The contradictory nature of this characterization calls for a word of comment and explanation and may serve as the occasion also for a brief delineation of the main topographical features and resources of the ancient Tano habitat.

Without entering into a lengthy discussion of historical questions again, it may be suggested that Espejo's description, the substance of which is given above, need not be regarded as referring to the Galisteo basin at all. As Bandelier points out, Espejo's characterization refers to a portion of the country occupied by the "Maguas," but he does not make it clear why the said Maguas should be identified with the Tanos. This is pertinent, particularly as Espejo later on entered the country of what he himself calls the Tamos or Tanos, and where he apparently received different treatment from what had been accorded him by the Maguas. Espejo certainly appears to distinguish the Tanos and the Maguas; but in any case, if this otherwise clever man could not recognize the Galisteo basin a second time after only a few weeks' absence his description of it merits little attention. In all probability, however, the region actually described by Espejo is the large shallow basin lying to the south of the Galisteo depression and known at present as the Estancia valley. This likewise barren expanse attracted primitive man chiefly on account of a number of saline lakes and salt deposits located over towards the southeastern limits; but its streams and springs, except to the west in the foothills of the Manzano Mountains, are practically negligible. The same cannot in strict truth be said of the Galisteo basin, as will be shown presently. Bandelier's visits to the Galisteo country appear to have been brief and in part at unfavorable seasons of the year. Furthermore he did not traverse the basin in every direction nor become thoroughly familiar with all the elements that made the country suitable for the sedentary Indian. On this supposition only can his ready acceptance of Espejo's description be understood.

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<sup>1</sup> Final Report, II, 100.

## TOPOGRAPHICAL FEATURES.

Topographically considered, the Galisteo basin is merely a small portion of the extensive structural depression lying between the Sandia-Manzano Mountain system on the west and the less elevated buttes and mesas of the Trans-Pecos highlands on the east. This barren intermontane plain has been eroded to somewhat greater depth in the vicinity of Galisteo than elsewhere, owing doubtless to a concentration of drainage at this point sufficient to force an outlet directly west to the Rio Grande. The concentration was brought about partly by the relatively high relief of the immediate border country and partly also by the comparative narrowness of the plain itself at this point (see map, p. 36).<sup>1</sup> The resulting marked depression is known as the Galisteo basin, the name being derived from a small Spanish or Mexican settlement which dates back to the seventeenth century and lies somewhat central in the basin but at the same time within two or three miles of its northwestern border.

More specifically, the Galisteo basin is a gently rolling plain little more than five miles across at its southern extremity, but somewhat more expanded along the northern border. The southern limit, about nine miles south of Galisteo, is marked by a steep acclivity, three or four hundred feet high, from the top of which one may view the much larger Estancia valley. The northern border, skirted, roughly speaking, by the Santa Fe railroad, is less well defined, because the basin here merges gradually into the higher and partly timbered plain which extends northward to Santa Fe, a distance of about fifteen miles. The extreme length of the Galisteo basin proper, from north to south, may therefore be fixed at approximately fourteen miles, while the width ranges from about five to eight miles. The immediate bounding features on the west are the bald dome of Cerro Pelon, towards the south, and some low broken hills towards the north. The former is an outlying prominence of the dark-looming Ortiz Mountains and the latter culminate in the less forbidding Cerrillos Peaks, both these primary uplifts being about the same distance away to the west and possibly one and the same mountain system cut in two by the collected drainage of the Galisteo watershed, which issues from the basin about midway on the west side to pursue its course to the Rio Grande some twenty-five miles away. On the east rises a less abrupt forested mesa, deeply carved, however, and with some extensive and prominent detached portions encroaching on the basin

<sup>1</sup> Sketch map showing the main features of the Galisteo basin and immediate surroundings. Based chiefly upon the San Pedro and Lamy topographical sheets of the U. S. Geological Survey, q. v.

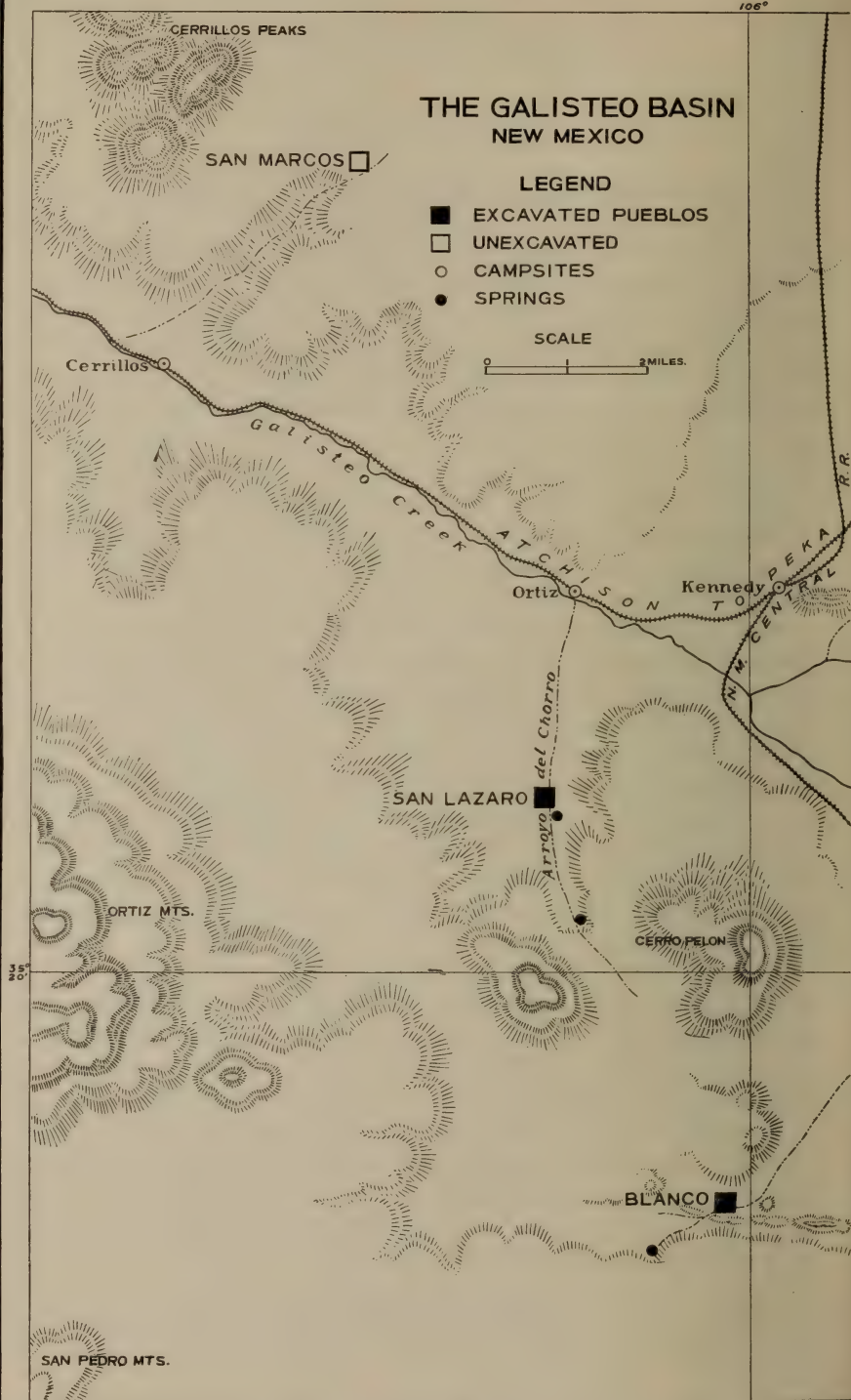
# THE GALISTEO BASIN NEW MEXICO

## LEGEND

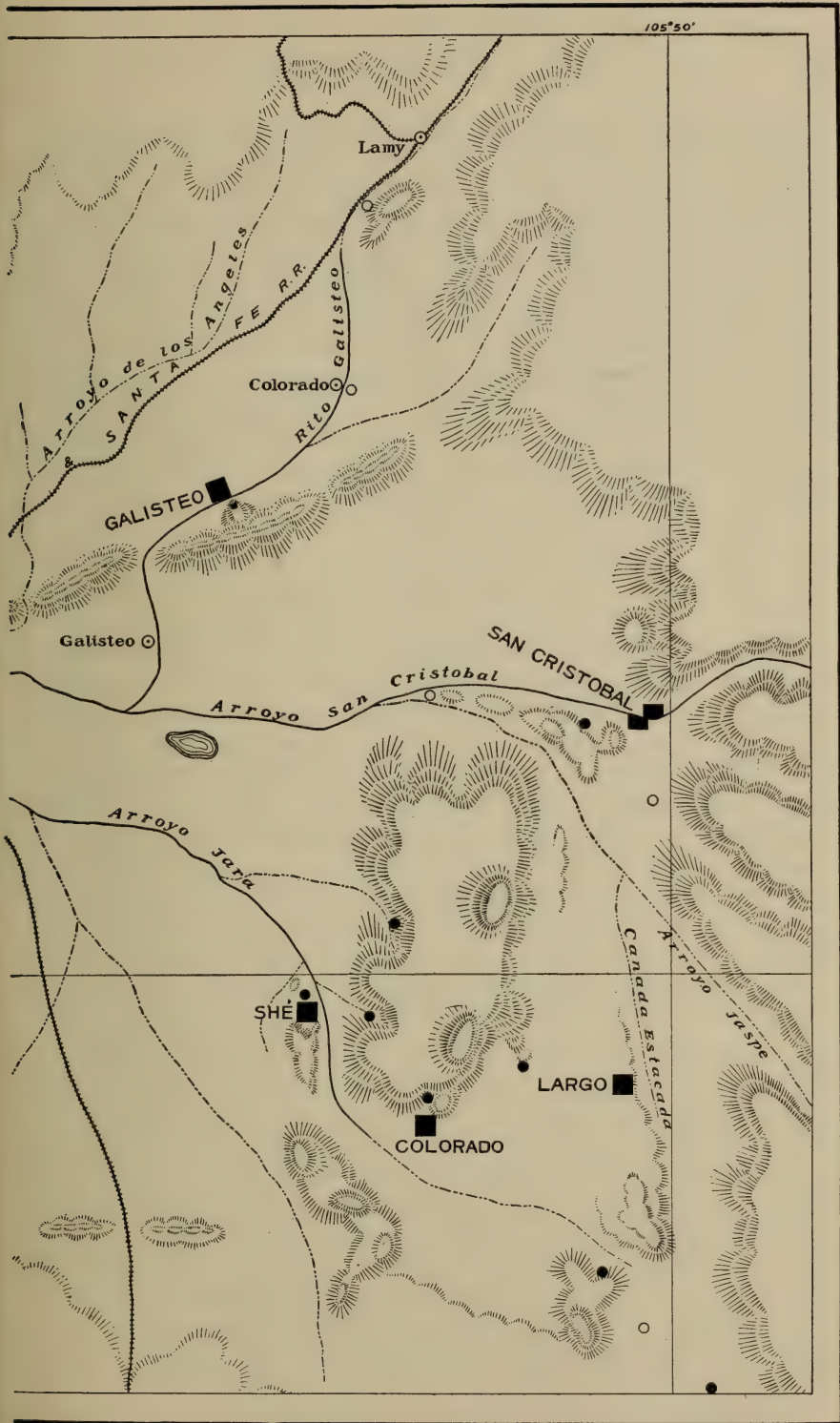
- EXCAVATED PUEBLOS
- UNEXCAVATED
- CAMPSITES
- SPRINGS

SCALE

0 1 2 MILES.

35°  
20'







along the southern half of its length. The northern and southern borders, as already pointed out, are not marked by old geologic uplifts, though within a mile or so of the southern extremity there is, running almost directly east and west across the basin, a remarkable volcanic dyke of considerable height. A similar dyke or "creston," as they are called locally, crosses the basin just north of Galisteo, or to be exact, from Kennedy station towards the northeast. As indicated on the accompanying sketch map, several more or less deep canyons open on the basin at various points, particularly on the northeast, along the east central border, on the southeast, and also on the southwest. At the level where the immediately surrounding foothills merge into the alluvium of the basin itself, these canyons are converted into as many steep-banked arroyos which traverse the basin in all directions to unite at the outlet already mentioned on the west side.

#### RESOURCES.

*Streams and Springs.* The Galisteo basin is, as Bandelier and Espejo have stated, a bleak and arid waste; it is not, however, without streams nor without springs. The San Cristobal creek maintains a very considerable flow the year round and the same, though to a lesser degree, is true of the Arroyo Jara. The water of these two streams is alkaline, to be sure, but it can be used both for drinking purposes and for irrigation. On the other hand, the Rito Galisteo, from a point near Pueblo Galisteo down to its juncture with the Arroyo San Cristobal, maintains a permanent flow of excellent water. Springs are not particularly abundant, but such as are known — and there are eleven of them — have been indicated on the map, and at least two more exist near the eastern limits of the area shown. In addition, it is proper to mention a number of natural hollows where small bodies of rain water collect and stand sometimes for several months of the year. The most conspicuous of these, located about two miles southeast of Galisteo, at times almost deserves the name of lake. Finally, the region affords a good many places where artificial reservoirs of considerable size could be made with very little labor and, as we shall see, the Tanos took advantage of this fact. It will be apparent, therefore, that the important problem of water supply was not so difficult for the aboriginal inhabitants of the Galisteo region as might at first appear to the casual visitor. There was not enough water perhaps for regular large-scale irrigation purposes, but, with plenty of tillable soil present, if dry farming did not work at times it is conceivable that the Indians may have carried water to their near by cornfields. In any case it seems unnecessary to resort to a theory of mete-

orologic and climatic changes to explain the presence of large prehistoric pueblos in this locality.<sup>1</sup>

*Climate.* The climatic conditions of the Galisteo region, considered in relation to the entire Southwest, may be characterized as on the whole favorable. The elevation ranges from 6000 to 6500 feet above sea level. Consequently the summer temperature is not very high and the air is generally dry, invigorating, and healthful. Thunder showers, sometimes of a torrential nature, are normally frequent between May and October. The winters are severe at times, with heavy snowfall, while the summers may occasionally be almost rainless, as was the case in 1913. The region is also subject to strong dust-carrying winds, particularly in early spring.<sup>2</sup>

*Flora.* The flora of the Tano habitat, while moderately important, cannot be adequately treated at the present time for lack of data. The region specifically considered in this paper is itself relatively poor, but it is hardly to be doubted that the inhabitants of the Galisteo basin drew upon the products of their entire tribal range, and until that range has been more thoroughly examined the subject may rest. Speaking generally, the Galisteo basin is open and barren except for a thin sprinkling of forage grasses and weeds. A certain species of prickly-pear cactus (*Opuntia*) is common in places along the high margin of the basin and further constitutes an annoying element to the archaeologist in that it flourishes to an unusual degree on the debris of the ruined pueblos. Higher up, in the foothills proper and on the sloping mesas, the familiar cedar and piñon, of a more or less stunted character, are abundant; and back in the deeper canyons, at least on the

<sup>1</sup> The suggestion of the gradual dessication of the Southwest as the cause and explanation of the movements of its prehistoric cliff-dwelling and pueblo-building aborigines has been advanced by Dr. E. L. Hewett, Junius Henderson, and Wilfred William Robbins, in *Bul. 54, Bur. Amer. Ethnol.* (1913). Upholding the same view, see article by Prof. Ellsworth Huntington, entitled "The Fluctuating Climate of North America," in the *Geographical Journal*, Vol. XL (1912), pp. 264-280, 392-411. But see also article in *Geographical Journal*, Feb.-Mar. (1914), by Prof. J. W. Gregory, entitled "Is the Earth Drying Up?" where the whole question is critically treated from a broader standpoint.

Personal observations in the Galisteo basin have not led to any definite opinions for or against the possibility of climatic changes. It may be pointed out, however, that the deep rocky gorge followed by the San Cristobal creek above the ruined pueblo of the same name appears to have been partly silted up in times past. At the present moment a deep secondary channel has been cut in the alluvium, which is being carried out again. Likewise a number of the arroyos crossing the Galisteo plain are developing new branches, some of which are lengthening at a fairly rapid rate. It is a question, however, whether these latter facts are due to a heavier rainfall in recent years or to the over-stocking of the range.

<sup>2</sup> From a published report (1913) of the U. S. Weather Bureau at Santa Fe may be cited the following figures, based on a sixty year period of observation and presumably very nearly correct for the Galisteo basin:

|                                   |              |
|-----------------------------------|--------------|
| Mean annual temperature           | 49° F.       |
| Mean highest temperature, annual, | 60° "        |
| Mean lowest temperature, annual,  | 38° "        |
| Average annual precipitation      | 14.2 inches. |
| Average annual snowfall           | 29.4 inches. |

east side of the basin, are scattered not a few good sized pines, as well as occasional clumps of cottonwood and oak brush. Piñon nuts unquestionably formed an element in the Tano food supply, but acorns, berries, etc., must have been negligible. Timber, of course, was useful and necessary both for the hearth fire and for building purposes.

*Fauna.* The fauna is another item which cannot be satisfactorily discussed at the present time. Most of the explorers and investigators from Coronado down to the present have had something to say on this point, and any future contribution to the subject had better be a confirmation or refutation of their statements, based upon the identification of the animal bones actually recovered by excavation. It seems inherently improbable that game was really plentiful in the Galisteo region itself. Still meat did form a part of the native diet, as is evidenced by an examination of the oldest refuse heaps adjacent to the pueblo ruins.<sup>1</sup>

The foregoing brief and inadequate summary of the material resources and physical environment is not going to explain the status and character of the Tanos, but it may serve to indicate some of the limitations and possibilities they had here and it will be interesting now to proceed to investigate how they adapted themselves to the conditions imposed and how they seized the advantages nature offered them.

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<sup>1</sup> For a brief general discussion of the Southwest flora and fauna, see Bandelier's Introduction to his Final Report, Part I. See also Dr. Walter Hough on "Pueblo Environment," Proc. Am. Assoc. Adv. Sci., 55th Meeting (1906); also, J. Henderson and J. P. Harrington on "The Ethnozoology of the Tewa Indians," Bul. 56, Bur. Amer. Ethnol. (1914).



# PUEBLO SAN CRISTOBAL (1646 ROOMS)

**LEGEND**  
 A-G = Refuse heaps  
 I-XIX = Separate buildings  
 1-2 &c. = Rooms excavated

**SCALE**  
 0 50 100 ft.







## PUEBLO SAN CRISTOBAL.

## SITUATION.

The first of the large Tano ruins to be excavated and the one on which most of the field-work was expended is Pueblo San Cristobal. This ancient as well as historic site is located about eight miles southeast of Lamy and six miles east of Galisteo.<sup>1</sup> The ruins lie on the banks of the Arroyo San Cristobal, immediately above the point where the stream emerges on to the open Galisteo plain and at the mouth of a deep, rocky gorge. The situation is sheltered by wooded hills and mesas, the latter of which present an escarpment on the north. The view is open only to the south, up a wide, comparatively treeless draw, and also to a limited extent to the west, through the gap followed by the creek in making its way among the outlying hills to the expansive and uninviting Galisteo basin. The creek in emerging from its deep canyon makes a southward bend around the base of the old smooth sandstone mesa which here dips southwestward. Down stream, beyond this bend, a small tributary canyon shoots off directly to the northeast along the base of the mentioned north side escarpment, and the upper end of this small gully reaches very nearly back to the main San Cristobal canyon at the point where its big bend commences. It is on the lower part of this somewhat isolated or detached triangle that the historic pueblo and also the larger portion of the prehistoric ruins are situated. The remaining portion of the prehistoric ruins, and probably the oldest of all, is located on the south bank of the creek, mostly west of the bend. The foundation here is alluvial and, as the stream is constantly cutting on this side, parts of at least two buildings and a valuable refuse heap have been carried away. A minor gully bounds this section of the pueblo on the west at present, but from all appearances it has been developed largely in recent times.

From an economic standpoint the site was well chosen: water, tillable soil, timber, building stone, and shelter were all near at hand. Strategically

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<sup>1</sup> To recapitulate the available surmises about Pueblo San Cristobal: the site has been, and perhaps correctly, identified with Pueblo Ximena, discovered by Coronado in 1540. However, the first authentic visit to the pueblo was made in 1590 by Castaño de Sosa, who named it. In the 17th century the place became a visita of the mission at Galisteo, but had a chapel of its own, built probably before 1630. The population in 1680 has been given as 800, a figure which, as we shall see, may be too large. The site was abandoned some time between 1680 and 1692, as in the latter year De Vargas found the inhabitants in their new home near Santa Cruz, from which they finally dispersed in 1696. The Indian name for the pueblo, as determined by Bandelier, is Yam-p-hamba.

considered, however, the situation seems weak, as it could be surprised from almost any angle in broad daylight, unless careful watch was kept on all the shielded avenues of approach. This fact, was evidently plain also to the ancient inhabitants, who may have learned in part through dear experience, for they erected something of the nature of a round watch tower on top of a small isolated hillock close by on the southwest, from which nearly all the approaches to the open surroundings of the pueblo on the south bank could be watched, at least in the day time. But an enemy might still have crept very close on all but the south side and might perhaps even have reached the old pueblo unobserved by following the bottom of the deep, box-like channel of the San Cristobal from the west and up stream. Whether or not it was this fact which led to the final abandonment of the older pueblo on the south bank for the somewhat stronger position exclusively occupied in later times on the opposite side of the stream is interesting speculation apparently incapable of proof. Still, the indications are that the more or less steep banks of the forking arroyos surrounding the new pueblo on all but the northeast side were regarded as a means of defense, because there are traces of a stone wall running from canyon to canyon across this vulnerable gap, about five hundred feet beyond the northeast corner of the pueblo.

#### GENERAL DESCRIPTION.

*Size.* The area enclosed in the accompanying groundplan (Plan I) of the San Cristobal pueblo measures about 1300 by 2000 feet. This space, to be sure, is not entirely filled with cultural remains; but, on the other hand, there are a number of more or less strictly organic parts of the pueblo scattered in different directions far beyond the mapped limits. Among these outlying elements are some small rock-shelters at the base of the escarpment to the north; an immense number of pictographs on the same escarpment and on the tumbled rocks below; also the stone wall previously mentioned as being five hundred feet above the northeast corner of the pueblo. On the south, two artificial reservoirs extend more than 1200 feet beyond the indicated limits and encircling these there are traces of five or six single-room houses. Among the rocks at the base of the north escarpment there are also traces of artificial walls, serving most likely as corrals and possibly of Indian origin. Then a little over a mile directly west of the pueblo, and south of the creek, there is a small, isolated, steep-sided mesa, known as the "middle mesa," the flat top of which is encircled by a considerable stone wall. The wall is missing wherever the natural declivity is at all steep and is otherwise so placed as to show that the mesa top, which

measures about 300 by 1300 feet, was a corral and not a fortification, as might easily be supposed. Still another possible organic part of the pueblo takes the form of a ruined house a short distance up the San Cristobal gorge, on the north bank and immediately below the escarpment of the mesa on which the main pueblo ruins lie. The Indian origin of this outlying building was not clearly determined.<sup>1</sup>

The pueblo itself, irrespective of its admissible partition into two or three chronological divisions, comprises nineteen or possibly twenty separate buildings. These have been numbered on the appended groundplan in order to facilitate description of the ruins as well as the location of the various specimens obtained from them.<sup>2</sup> A few of these buildings, like III, VII, and XIV, e. g., are simple rectilinear structures, but the majority are composed of several united parts or wings, arranged for the most part, it would seem, with reference to the cardinal directions. All told there are 38 such buildings or wings of buildings, which if placed end to end would cover a stretch almost exactly 5000 feet long and about 40 feet wide, giving sufficient space for very nearly 2000 ground floor rooms. Actual conservative calculation places the number of such rooms in the entire pueblo at 1645, a figure considerably below what is sure to be found by the future excavator.

*Communal Buildings.* The present appearance of the different buildings constituting the entire ruin varies considerably. Some of the oblong, convex mounds representing the collapsed one to two or three-story structures are

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<sup>1</sup> In this connection it may be well to mention the fact that there are rock-piles, some small and some large, scattered over the surface of the open flat which extends several miles to the south of Pueblo San Cristobal. Whether these are house ruins or graves or what was not ascertained. One such place has been indicated as a campsite on the general map. It lies fully one mile south of San Cristobal on a low rocky knoll near the east side of the draw. Here are traces of old walls, and fragments of flint, obsidian, and pottery lie all about as if possibly there had been a small pueblo on the site.

Another place of interest is a so-called "arrow cliff," located about two miles up the San Cristobal gorge, near the point where the supposed San Cristobal-Pecos trail leads out of the gorge up on to the mesa proper. The cliff in question forms the north wall of the gorge and the vertical or partly overhanging section, about 100 feet long, rises some forty-five to fifty feet above the alluvium. Near the base of the cliff there are several pictographs in black, red, and light yellowish colors. Other pictographs occur near the top of the cliff and also on the inaccessible horizontal overhang. The cliff itself furnishes good shelter and there is a considerable bed of ashes at the base, showing that the place has been used as a campsite. However, the chief point of interest about the spot is the fact that all who know it tell of numerous arrows that were formerly stuck into the crevices of the cliff. None are now visible, though the broken ends of many are said to be held fast in the crevices. One fragment, in the hands of the foreman of Senator Pankey's ranch, was seen and it showed a light arrow composed of a reed shaft to which was attached a wooden foreshaft with windings at the joint and traces of red paint.

<sup>2</sup> The attempt to distinguish the individual buildings without actual excavation is sometimes difficult, if not impossible. Hence, some of the first determinations were later found to be wrong; but inasmuch as the specimens obtained had already been catalogued by buildings, the errors committed will have to stand. In future, for the sake of simplicity, it is contemplated to number separately each individual wing of a given building.



low, compact and smooth-surfaced, while others are high and very rough on top, with here and there a corner wall standing slightly above the general level of the debris, as if the falling process was recent and not yet complete. Thus the ruins on the south bank of the creek might well be contrasted with the majority of the ruins on the north bank in this respect, the former being most of them low and in places difficult to trace. Furthermore, the thick growth of cactus bushes which flourishes on all the high rough-surfaced ruins is scarce on the low compact ones and is in fact altogether absent from the ruins on the south side of the creek. Actual excavation shows, however, that the walls of the south bank ruins stand about as high as those of the north side ruins and suggests that the noted compactness and smoothness is not the result entirely of natural causes. The rough-surfaced ruins could never, relatively speaking, weather into the condition represented by the others. Moreover, this low, flat condition characterizes some of the buildings in the north ruin, as, e. g., buildings V, VI, VII, part of VIII, also XII, and especially XVII. Buildings XIII, XIV, XVI and part of XV are also affected, but not so much. Superficial indications are therefore not entirely satisfactory as evidence on which to base a judgment about the age of the ruins, and it is at least unsafe on that ground alone to conclude with Bandler that the south bank ruins as a whole are older than those on the north bank.<sup>1</sup> If it is made known now that the rough-surfaced ruins, comprising buildings VIII, IX, X, XI and part of XV, with a combined capacity of fully 650 ground floor rooms, were found to date from historic times, and that most of these had been built on top of earlier ruins or refuse heaps, it is easy to understand why they should appear to represent relatively high buildings. It seems also probable that at the time when the historic pueblo was built, or perhaps in part rehabilitated, most if not all of the old prehistoric pueblo was in ruins and that the smooth, compact surface of these ruins resulted largely in consequence of the removal of building material, i. e., stone slabs, from their surface to be used in constructing the new pueblo. This explanation may not hold in all cases for the south bank ruins because some of these represent structures built partly of adobe, but it no doubt played some part, as it did also on the north side, where it would be difficult otherwise to account for the fact that in building XVII the remaining walls stand barely two feet high.

*Courts.* The building wings, disposed as they are mostly at right angles to one another, enclose wholly or partly no less than 11 angular courts, some small and some very large. In places where the courts are not completely surrounded by buildings there are often traces of a stone wall crossing

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<sup>1</sup> Final Report, II, p. 103.

the open space. Examples may be indicated connecting buildings VI and IX, the separate parts of the south wing of building IX, buildings XIII and XIV, XII and XVII, and also buildings VIII and XVII. Openings leading from one court to another probably existed, though they are not always visible today. The courts themselves deserve a few remarks. Some of the enclosures appear unnaturally deep, as if the surface soil or adobe had been removed. In the court situated between buildings X and XVI the solid rock surface of the mesa on which most of the north pueblo was built has actually been laid bare. It is true that the surface adobe was probably very thin on this originally smooth slope, but it is a proper question after all whether even the small amount present was not used up for mortar when the adjacent buildings were under construction. In the large double court enclosed by buildings VIII, XI-XV and XVII there are several things of interest. Thus, in the middle and upper part occur traces of the walls of two small rectangular corrals, one having been constructed against building XIII, the other against building XV. The lower section of this same court may possibly have been a reservoir. This conclusion is based on the nature and thickness of the wall on the lower side, connecting buildings VIII and XVII, and also on the fluvial nature of the soil in the court. It could not have been a large reservoir, however, because the area to the northeast that could be drained into it is very limited. Flush waters now enter the court during occasional showers by way of a rill which cuts the wall connecting buildings XIII and XIV. By accidental digging an old covered-up wall was found running west from building XIII out into the supposed reservoir, showing that there was something here prior to the construction of the buildings now lying in visible ruins. On the north side of the reservoir, close to the south end of the middle wing of building XV, stands a roughly rectangular column of sandstone about three feet high, the top of which contains several saucer-like hollows. Presumably it has served as some sort of rest or anvil. Close by, to the southwest, there are faint traces of a refuse heap. Most of the other enclosures have nothing of interest in them excepting a few kivas.

*Kivas.* In the court partly formed by buildings VI and IX and close to the simple wall completing the north side there is a hollow suggestive of a kiva. A similar hollow occurs in the southwest corner of the court completely enclosed by building IX, but a trial excavation here revealed nothing of the sort, though it led to the discovery of a cache containing thirty-six metates, apparently buried in the ground. Through the same circumstance an ancient and entirely obliterated kiva (C) was found in the northwest corner of the court. This chamber was not excavated further than to learn that it is circular, with a diameter of 36 feet, and that the well-built

stone wall still stands over five feet high. Finally, over on the south bank of the creek in the court enclosed by buildings I, II, IV, etc., there was another large and presumably also ancient kiva, marked A on the ground-plan. Faint traces of the stone wall remain, but excavation proved it to go but slightly below the outside surface; yet it is certain that the kiva was partly subterranean. There appears to have been an entrance on the east side, a little towards the south, and in the wall directly opposite there was a small recess. The diameter of this kiva was almost 50 feet. Kiva B, incorporated in the east wing of building IX and dating from historic times, was completely excavated and will be referred to later. The diameter of this chamber at the bottom was exactly 20 feet.<sup>1</sup>

*Refuse Heaps.* No less than eight deposits of refuse are visible about the pueblo. The smallest accumulation, hardly worth mentioning, is within the easternmost quadrangle; but the remainder, as may be observed, lie practically outside of the village buildings. Only one pile (marked D) is impressive in size, and appearances may even here be deceptive owing to the contour of the original surface and also to the fact that the refuse seems to cover up the ruins of a building. Deposits A and B show up on the surface hardly at all, but their positions with reference to the stream channels are such that complete and interesting sections respectively 4 and 12 feet thick have been exposed. The depth of the accumulations in B, and the fact that a large segment may have been removed by the stream, bespeak a very considerable antiquity for the adjoining part of the pueblo. Before quitting the site, trial trenches were dug in all of the larger deposits and the results obtained will be dealt with farther on.

*Reservoirs.* A reservoir has already been mentioned in describing the court north of building XVII. It was a small affair, however, and was probably developed in historic times partly through the accidental arrangement of the older ruins. But about 400 feet south of building IV, and up against the watch tower hill, lie the remains of a large dam. This artificial obstruction spans the outlet to a large shallow basin above. The dam is fully 300 feet long, measures as much as 50 feet through the base, and stands almost 5 feet in height, but it has no doubt been washed down considerably. The dam bows down stream and is made largely of adobe, though some rocks appear at the base on the inner side. Accurate leveling would be necessary to determine the extent of the reservoir above, but it must have run back southward about 900 or 1000 feet and the width in one place was

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<sup>1</sup> Bandelier (Final Report, II, pp. 103-4) says that there are two kivas in the south pueblo and one in the north pueblo, which statement is true only if reversed. He probably refers to Kiva A and to the two hollows pointed out on opposite sides of the west wing of building IX. Kiva B he might not have recognized and C he could not possibly have noticed.



not less than 600 feet. Present conditions, however, are no sure indications of its original capacity, as the dam on the one hand may have been much higher than now and on the other hand the basin itself may have silted up considerably. Immediately above the limits of the large reservoir there was another but a much smaller one. Both dams are partly washed out now, but could easily be repaired, an undertaking which would prove of value to any future excavator of the pueblo.

*Watch Tower.* The supposed lookout ruin, which lies on top of a small hill bounding the south pueblo on the west or southwest side, merits a few remarks. Perhaps 150 feet high, the hill affords a splendid view, especially to the south and the northwest. The top is nearly flat and oval in outline, measuring about 60 by 200 feet. In the widest part of the oval lies the ruin, which consists of two nearly circular concentric walls, now barely three feet high and apparently thrown down by other than natural forces, as many of the stone blocks of which they were built are large and heavy. The outside diameter of the outer wall ranges from 33 to 36 feet, while the inside diameter of the same wall varies from 24 feet 6 inches to 30 feet. For the inner wall the outside diameter ranges from 12 to 14 feet and the inside diameter from 6 feet 6 inches to 8 feet. The inner wall is approximately 2 feet 6 inches thick and the thickness of the outer wall ranges from 3 feet to 3 feet 6 inches. Thus a passage, roughly speaking 14 feet wide, separates the two walls. Well preserved entrances appear on the east side, a little towards the south, and in front of these, perhaps 15 feet away and near the edge of the hilltop, there are traces of a roughly piled wall, which may have served to shield the entrances. Strange to say, there is not enough debris to build up the two walls to man's height, and as building stone is near at hand it is hard to believe that the upper part was built of adobe which might since have washed away. In short, though the inner passage was cleared to bedrock, nothing was found to indicate the function of these remains, but all the circumstantial evidence points to a round hut encircled by a low wall, suitable for nothing so much as a lookout.<sup>1</sup>

*Rock-shelters.* A small but rather noticeable rock-shelter is situated about 300 feet below the large dam and close to the east base of the watch tower hill, from which it is separated by a dry gully leading down from the reservoir. The shelter consists of a big thick slab leaning against a large boulder in such a way as to give a southwest exposure. With very little labor it could have been made into a comfortable home, and in attempting to improve it for camp use some traces of aboriginal occupation were found,

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<sup>1</sup> The only find made while clearing up between the circular walls was a single oblong worn quartz rock, probably of ceremonial use; but there was otherwise nothing to indicate that the place had been a shrine.



as might have been expected. Almost directly north of this place, at the base of the escarpment repeatedly referred to, a more promising rock-shelter was found. There is here a perfectly horizontal overhang measuring nearly 18 by 18 feet, and traces of a wall which once reached from the ground to the natural roof are visible, as is also the doorway on the south. The situation is such that the rains have filled the natural cavity almost completely with sand and fine debris. A trial trench was run across the deposit and it revealed a section over five feet in thickness, showing two separate culture strata. One stratum, made up mostly of ashes and charcoal and only two to three inches thick, was found about one foot below the surface. The other stratum, also of clear ashes, rose from the bottom to a thickness of fully one foot six inches. In the center of the room, which was the deepest place found, there were traces of a rude fireplace built up of stone. A very few fragments of obsidian and glazed pottery were found, but the site gave no indications of being older than the adjacent pueblo itself. Other small shelters were tried, without results.

*Chapel.* Although not an essential part of the subject, it may be permissible to record a few data relative to the chapel. The ruin is situated on the alluvial bottom within the bend of the creek, directly south of the historic pueblo, and still stands apparently in the condition in which Bandelier found it thirty years ago. The simple structure is oriented almost correctly east and west, with the door in the east end. The outside length was approximately 70 feet and the outside width near the altar was 29 feet, while close to the front end it was apparently about 32 feet. The inside width near the altar was 23 feet, so that the walls were about 3 feet thick.<sup>1</sup> Only the altar end portion of the chapel stands today, owing to the bracing effect of the four angles embodied, and it shows a fine piece of masonry laid up of thin stone slabs embedded in adobe. The total height of the visible wall is not less than 25 feet, but the base is buried in debris. A nearly rectangular cemetery or yard fronts the church and measures about 54 by 65 feet. On the south, running out from the altar end of the chapel, there is a roughly L-shaped accessory group of joined buildings containing about twenty rooms, and to the south and west of these buildings are two adjoining corrals. The whole assemblage — church, cemetery, and house ruins — gives abundant evidence of the treasure hunter's energy.

<sup>1</sup> Bandelier's precise dimensions, 24.5 by 52.5 feet (see Final Report, II, p. 104), are so radically at variance with the above figures that it seems necessary to mention the fact in self defense. The height of the standing wall is nearly twice that of Bandelier's figure. He also reverses the true relative positions of the chapel and the main pueblo with reference to the old pueblo on the south bank of the creek, and his published groundplan of the entire pueblo bears little resemblance to the one accompanying this paper. In fact, Bandelier's entire Tano chapter abounds in errors, more or less pertinent; but many of these may have resulted unintentionally from the fact, as told me by Dr. E. L. Hewett, that the author did not have opportunity to correct his proof sheets.





SAN CRISTOBAL

View looking southwest across San Cristobal Creek towards the watch tower hill. Shows debris thrown out of building I on the left, the corner of the same building projecting on the creek; also the five rooms cleared in building II and adjoining it on the right the excavations in refuse heap B.

(Page 49)



## EXCAVATIONS CONDUCTED.

In approaching the problems presented by Pueblo San Cristobal for the first time, there was lack both of experience and of data to guide the earlier stages of the investigation. Bandelier's examination had not been such as to enable him to figure and describe the pueblo and the relations of its parts correctly; but some of his observations held and from these it was clear that the ruins were essentially in the same condition as when he saw them. The chief point made by this investigator was that the ruins on the south bank of the creek were older than those on the north bank; and though this statement was not strictly borne out by superficial appearances, it seemed best to accept that view as a working hypothesis. Work was therefore begun on the south side of the creek, where it was practically confined to those buildings lying nearest the stream. Two of these structures had already been partly undermined and carried away, as in Bandelier's day, and a third was in extreme danger of the same fate. In attempting now to describe the main facts brought out by the excavations it is the aim as far as possible to avoid endless repetitions of figures and details. Therefore all the measurements have been thrown into tabular form, which the interested student will find at the end of the report.

*Building I.* This nearly rectilinear structure lies separate from other buildings, close to the high creek bank and on ground sloping towards the east. The northwest corner actually juts out on the creek and five rooms have here been either wholly or partially removed (Plan I, also Pl. 1). Originally the building must have been three rooms wide throughout, with the possible addition of a fourth row of rooms midway on the south side. Doubt enters because the north wall is largely missing and must have fallen out en masse before the rest of the building collapsed. There is some doubt also about the four extra rooms adjoining on the south, for the reason that while traces of the bounding walls appeared on the surface they could not be found lower down. The extreme capacity of the building may therefore be limited to 46 ground floor rooms.

The plan of the building and the nature of its foundation are both suggestive. Upon excavation most of the short partition walls were found to run straight across the entire building, but there were exceptions. With the long walls it was different, however. Viewing them from the west they ran mostly straight and parallel to a point a little beyond the middle of the building, where they swerved northward so that the east end of the building was about five feet out of line. These facts seem to indicate that though the building forms a unit it may have been constructed in two sections at



different times. There was nothing found in the ruin, however, to indicate that one end of the building was much older than the other. Nor is the building one of the oldest in the pueblo, because the northwest portion of it was found to rest on 2 to 3 feet of ashes and refuse while the east end had been erected on top of the ruins of an earlier building, the parallel walls of which ran at an angle to those of the last structure, as may be observed in the accompanying illustration (Fig. 1).



Fig. 1. View looking West along Building I, San Cristobal, showing the Separate Walls of Superposed Prehistoric Edifices.

By referring to the appended table it will be observed that the standing walls rose from about 2 to 6 feet in height,<sup>1</sup> the west end being considerably higher than the east end and much higher than the middle portion of the building. There is even a probability that the height of the east end walls is given in figures relatively too large, because the clay floor could not always be detected as was the case at the west end of the building, where the floors were often flagged with stone slabs or were otherwise well preserved and distinguishable. The walls were nearly all somewhat less than 1 foot in thickness, the usual measurement ranging from 9 to 11 inches; but 14 and even 18 inches were noted, e. g., at the east end of room 4. Curiously enough, the north wall of the same room was 26 inches thick, but on closer

<sup>1</sup> The floors in rooms 3 and 5 were a foot or more below those of the adjoining rooms so that the remaining walls of these two rooms were actually over 7 feet high.

examination this partition was found to consist of two separate walls, one of stone and one of adobe. As a matter of fact, stone and adobe were used indiscriminately in different parts of the building, suggesting again that the structure had been repaired or rehabilitated at different times, if it had not actually grown to its final size by slow accretion. As to the original height of the building it is difficult to speak; the east end may have had only one story but the west end was at least two stories high.

The size of the rooms varied unusually: widths ranged from 5 feet 3 inches to 8 feet 2 inches and the lengths from 7 feet 7 inches to 18 feet. But the student is referred to the tables for both specific and average measurements.

The excavation of the building brought to light a few minor details of interest. There were, e. g., no doors through any of the walls, outside or inside. The walls themselves showed traces of mud plaster and occasional evidences of blackening, as if by fire; though no regularly built fireplace was discovered in any of the rooms. Lumps of clay bearing impressions of grass and reeds were found in rooms 4 and 8 and were presumably parts of the ceiling. There were fragments of charred wood in several places and across room 1 lay a rotted cedar beam 4 feet long and 3 inches in diameter. Specimens of all kinds, including potsherds; common artifacts of stone, bone and shell; bones of indigenous animals and five human burials, were found scattered at various levels in the debris, giving additional proof that at least a part of the building was more than one story high. Moreover, in the debris were also found several specially shaped stones such as were used to support the cooking slab over the fireplace. The occurrence of these stones, in the absence of fireplaces on the ground floor, shows that fireplaces must have existed on the floor above. None of the various types of artifacts gave any clue to the relative prehistoric age of the building.

*Building II.* There is little to be said about this large compound structure, inasmuch as only eight rooms were excavated in it. The wing nearest to building I had been partly carried away by the creek, to the extent possibly of ten or fifteen rooms, and in order to save the remainder, at least for the present, a complete row of the projecting rooms was excavated (Pl. 1). In addition, three rooms were cleared farther back in the ruin merely to try it out.

The five rooms next the creek were separated by very thin adobe walls, which for the middle room rose to a height of 5 feet 6 inches. The outer walls were partly of stone and somewhat thicker. Hard tamped adobe floors were easily recognized in each room. Specimens of all kinds, including artifacts, indigenous animal bones and human remains, were found distributed precisely as in building I. Near the south end of room 1 and

about 3 feet below the surface was found an adult skeleton, parts of which extended well into the adjoining room. The inference is that when the interment was made the ruin looked very much as it does today, no wall being distinguishable or it would have been avoided by the grave digger. In this same room, with an infant burial deeper down, was found a food bowl of the old style black-and-white ware. This was the only entire pottery vessel obtained from the 130 rooms excavated on the south side of the creek. There were fragments of similarly painted ware and also of the black corrugated variety, but the glazed sherds were everywhere present. This particular wing of building II had been at least two stories high.

Rooms 6 and 7, located farther back in the seemingly high part of the ruin, yielded proof that here also we have the remains of one building lying on top of another. Room 6 was shallow and room 7 very deep. Unfortunately the latter was not cleared to the bottom. The few specimens brought to light do not of themselves indicate great difference in age, however; but there can be no doubt that further excavation here will give good chronological results. Room 8 was shallow and contained nothing of interest except an adult burial. The shallowness may possibly mean that another ruin lies buried underneath.

*Building III.* This simple rectangular structure lies off by itself, farthest to the south on high ground and close to the sharp return bend of the deep arroyo. Situated as it was, the building seemed in imminent danger of being removed by the stream and for that reason its complete excavation was decided upon. Superficially viewed, the ruin was a very regular oblong mound with an east and west axis and dimensions approximating 50 by 200 feet. Its convex surface was bare and smooth but the tops of the standing walls, though flush with the debris, showed in many places. Work was commenced by trenching along the outside wall so as to make sure of getting all of the building and its correct outline. The plot incorporated in the general groundplan is unfortunately too small for details, but a larger reproduction may follow in a future general discussion of pueblo architecture.

The completed excavation laid bare the entire lower story of what appears to be a single unified structure 4 to 6 rooms wide and 14 to 15 rooms long (Fig. 2). The four northernmost long walls are tolerably straight and parallel but the fifth, towards the south, has several jogs or irregularities, especially from room 43 westward. The short walls also run fairly straight and parallel across the building, with a marked exception at rooms 52 and 71. It seems reasonable to suppose that rooms 1 to 4 scattered along the north side, room 5 on the east end, and rooms 6 and 16 on the south side were late additions and that the main nucleus was a structure, 4 rooms wide and 14



rooms long, designed and built at one time. However, there is no conclusive evidence to support this contention, which consequently may be only partly correct. The ground floor capacity of the building has been limited to 72 rooms, but there are indications of additional rooms on the north side. Judging from the nature and occurrence of the specimens collected, as well as from the height of the standing walls and the amount of debris, the central portion of the building was originally more than one story high.



Fig. 2. Building III, San Cristobal, seen from the Watch Tower Hill, Left View showing Cleared Outer Rooms, and Right View, the Cleared Inner Rooms after Completed Excavation.

A few detail features of the building construction and furnishings may be mentioned. The rooms vary somewhat as to size, though the extremes would be removed by lopping off the outside row, already referred to as possible later additions. The average for the building accords well with the average for the pueblo as a whole, i. e., the normal room measures about 7 by 11 feet. Room 13 was excluded from the estimate because of its



abnormally small dimensions; in fact it may have been only a recess in the wall. The walls themselves rise from 2 feet on the outer edges of the building to over 5 feet along through the middle. They are almost uniformly less than 1 foot in thickness and are for the most part of stone, though there are many indiscriminately scattered sections built of adobe. In some walls there is adobe at the base and stone slabs laid in mud above, and elsewhere this condition is reversed. Comparatively speaking the masonry is excellent, the walls standing straight and firm with only here and there a leaning this way or that; whereas in the historic ruins it is quite otherwise. Mud plaster remained near the base of the walls in nearly all the rooms and the finger mark of the artisan who applied it was often visible. Traces of whitewash (two separate coats) were detected only in



Fig. 3. View of Southwest Corner of Room 21, Building III, San Cristobal, showing a Small Bin, also the Nature and Height of the Building Walls.

rooms 30 and 31, but many of the walls were blackened as if by smoke. There were, however, no fireplaces on the ground floor, the only suggestions of such furnishings being merely a pile of ashes in one of the corners of rooms 4 and 17; but there were ample proofs that there had been fireplaces on the floor above. A small artificial niche or pocket was found in the east wall of room 21 and in the southwest corner of the same room was an angular bin (Fig. 3) produced by setting on edge a couple of thin stone slabs. Doorways were practically absent. There was indeed one connecting rooms 56 and 67 and there may have been another leading directly from

out-of-doors into room 5. Accurate measurements of the first-mentioned are lacking, but it was about 2 feet wide and may have been 3 feet high, with the sill raised a foot or so above the floor level. The floors wherever noticeable were of tamped adobe.

The architectural remains, it will be seen, are so simple as to be almost barren of suggestion and the same holds practically true of what was found in them. Artifacts were relatively plentiful, no less than 392 complete specimens being recorded, but not a single complete pottery vessel worth the name was turned up, though there were fragments enough of incomplete specimens including the corrugated, painted, and glazed varieties. The majority of the artifacts were of a utilitarian nature: metates, manos



Fig. 4. View looking West over Outer South Side Rooms of Building III, San Cristobal, showing Stacked Metates, etc.

(Fig. 4), cooking slabs, grooved axes, hammerstones, rubbing stones, polishing stones, and chipped obsidian points; also bone scrapers, awls, and spatulas. But there were numerous esthetic and ceremonial objects, including beads, pendants, flutes and whistles, together with such natural forms as quartz crystals, pebbles, concretions and fossils. Room 68, e. g., contained about 70 of these fetich-like objects lying in a heap in the middle of the floor. A few animal bones, including those of the turkey and the bison, were found; but, on the whole, osseous remains both human and animal were scarce.

In the presence of all the available facts one is at loss to understand the

later history of this building. It was not burned down and it was apparently not abandoned in great haste or there would have been some complete, if perhaps broken, pottery vessels left behind. At the same time there were found a large number of other articles, some small and light and seemingly valuable, others heavy and clumsy but nevertheless useful. If the building was vacated during times of peace for new or more suitable quarters in the pueblo and left to natural decay, why should anything of value have been left in it? There remains only the hope that further excavation of the prehistoric ruins may throw light on the subject.

*Buildings IV-VI, XVIII and XIX.* These ruins were merely tested by excavating a few scattered rooms and it is not the purpose to enter upon a discussion of details concerning them. They are spread out considerably and are even separated by the creek, but are all prehistoric and apparently of about the same age. Building XVIII was originally supposed to be a part of building IV; likewise building XIX was thought to be connected with building II; hence the discrepancy in numbering them. Their combined capacity will not fall much short of 330 ground floor rooms and though low and flat in appearance the sound stone and adobe walls in them stand from 3 to 6 feet in height.

It may also be explained in this connection that the long wall extending from the northwest corner of building IX towards building V appears to be of prehistoric date and the same may be said of the two rooms indicated as built against its north face.

*Building VII.* This small five-room affair lying at an angle across the west end of the court separating buildings VIII and IX need not detain us long, though it deserves special mention. The house is of prehistoric date but, judging from its situation on top of a considerable refuse heap (C), it must be a great deal younger than some other part of the pueblo. Nevertheless, the ruin was too small to furnish any satisfactory chronological evidence. Stone was employed in its construction but the remaining walls stood barely two feet high. The rooms were regular and of normal size. No doors were visible and no floor could be discerned. The excavations were carried three feet below the base of the walls, through the refuse heap to the natural surface, in order to secure all data that the stratigraphic relations might offer.

*Building VIII.* The remains of this structure lie about midway on the south side of the more recent division of the pueblo. Superficially the ruins suggest a building of unusual proportions, being notably high and measuring 450 feet in length and as much as 65 feet in width. The main wing lies east and west, but two short additions project northward. Its calculated ground floor capacity is 253 rooms, a figure not exceeded by any other building in the pueblo.



Only seven rooms were excavated in the big pile and no detailed statement will be attempted. Rooms 1-3 and 5 showed good walls built of adobe blocks, while the other rooms were bounded chiefly by stone walls much less sound and substantial. In room 5 there was a doorway through the west wall, measuring 2 feet 2 inches in height and 1 foot 6 inches in width. The sill was 2 feet 2 inches above the floor level and the whole aperture was framed by thin slabs of sandstone with dressed edges. The wall itself, surrounding the doorway, was 11.5 inches thick. Hard adobe floors resting on the natural surface were found in all these compartments. Contrasted with these, rooms 4, 6, and 7 had no discernible floor, but 4 and 6 were underlaid by nearly 6 feet of refuse. Consequently the building was perhaps not so high as appearances indicate. The superposition here of culture material of different ages makes this another spot in the pueblo worth further excavation. We may dismiss the subject for the present by simply stating that bits of corroded iron, bones of various domestic ungulates, and traces of a new variety of glazed pottery were found in several of the rooms, so that there can be no doubt that most of the building was occupied during historic times.

*Building IX a. b.* Unfortunately this so-called building is composed of two really separate and distinct parts, connected by thick walls. These walls are prolongations of the north and south wings and were at first thought to be the ruins of actual buildings, but the later removal of grass and cacti and some excavation showed the error.<sup>1</sup> The western section of this building group (IX a) may be passed over with the remark that it is of historic date and that the remains of an older building underlie at least the high west wing. Of special interest perhaps was the presence of two fireplaces in room 27 and the fact that the walls here showed several applications of whitewash. The eastern section (IX b) drew attention to itself because of the apparent incorporation of a kiva (B), which it was finally decided to excavate. In order to do this with the least possible waste of labor some of the rooms surrounding the kiva were also excavated, the result being that the larger portion of the east wing was cleared.

As may be observed on the groundplan, the building was about 50 feet wide, and into this space was compressed no less than six rooms at the south end while across the north end there were only four. In general the 26 cleared compartments surrounding the kiva were irregular both as to size and outline, rooms 11 and 12 especially so. The fact is that the east

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<sup>1</sup> This fact of separation, through an oversight, has not been distinctly brought out on the groundplan, where the north and east wings appear to join. That was not the case in historic times, however, though there is some indication of such connection of older and partly removed buildings that once occupied this corner.

wall consisted largely of angular recesses and buttresses with apparently an outside door leading into room 11. The walls, built of stone and in a fair though variable state of preservation, rose to a height of nearly 8 feet at the south end. In places there were holes marking the insertion of ceiling timbers about 5 to 6 feet above the floor, and several fragments of the rotted beams, lying east and west across the rooms, were found in the debris. The building was no doubt two stories high, at least to the south of the kiva. The walls were plastered and showed as many as three successive coats of whitewash. Some rooms were blackened, particularly in the corners, but



Fig. 5.

Fig. 5. Doorway leading into Room 20, Building IX, b, San Cristobal.



Fig. 6.

Fig. 6. View of the Northwest Corner of Room 13, Building X, San Cristobal, showing the Secondary Wall (on the right) on which the Ceiling Timbers rested; also Height of Plastered Wall above this Ceiling. Note Groove in Wall at Base of Yardstick where Secondary Ceiling Timbers ran through to the next Room. See Fig. 8.

there were no ashes on the floor or other unmistakable indications of fire-places, except of such as belonged to the upper floor. The ground floors themselves were for the most part flagged with stone. Doorways were few and in all but one instance uncertain. Between the kiva and room 11 there were two small triangular rooms or spaces which would seem to have been

open (i e., not filled with debris or masonry), because a door measuring 1 foot 6 inches by 3 feet 8 inches led from one of them into room 20 (Fig. 5). The inference drawn from these facts is that the kiva was constructed some time after the completion of the building and that room was made for it by tearing out some of the partitions of the regular community house. Possibly this was done after the establishment of the mission and kept secret. However, this is pure surmise.

The kiva itself yielded very little of interest. It was circular and measured exactly 20 feet in diameter at the bottom. Its walls were down completely in places and what remained stood to a height of 6 feet and over. There were no visible entrances, though such might have been incorporated in the fallen sections of the wall. The floor was of tamped adobe and was marked by three thin rectangular sandstone slabs. One of these slabs, measuring about 2 feet square, lay close to the center of the kiva. Perhaps it was originally inserted into the adobe floor. Another of the same size lay toward the northwest, not far from the wall, and a third and smaller one lay very near the center slab on the northeast. There was nothing either on top of them or underneath. No traces of fireplace or ashes were discoverable. A few of the common artifacts — mostly fragmentary, some potsherds, and also bones of cattle, sheep, etc., were found. The most suggestive object recovered was a rim fragment of a cast metal bell.<sup>1</sup>

From the rooms surrounding the kiva there were obtained numerous artifacts of the usual types. A few pottery vessels of the painted and glazed varieties — probably of prehistoric make — were found, and sherds of all kinds, including some with a greenish, modern-looking glaze, were abundant. Bones of various domestic animals, small and large, were frequent, as were human burials, particularly in or below the rooms on the northeast side of the kiva. It should be explained, however, that these burials may antedate the erection of the building itself, because the northeast portion of it, in common with the south side of building X, stood on a refuse heap.

*Building X.* This building was singled out for complete excavation

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<sup>1</sup> The presence of this bell fragment recalls Bandelier's discussion (Paper Arch. Inst. Am., Amer. Series I, pp. 41–42, 101, 121–122) of the removal of the Pecos mission bell in 1680 to the high mesa in the direction of Pueblo San Cristobal. The author thought that the Indians of the latter pueblo sacked Pecos about the time of the great Rebellion because of its friendly attitude towards the Spaniards, and that later on, in retaliation for this, the people of Pecos assisted the Apache and others to drive the Tanos of San Cristobal and San Lazaro out of the Galisteo basin. As I understand Bandelier's statement (p. 101) he saw the broken bell himself (ca. 1880), where it had been dropped near the head of the canyon leading down to San Cristobal. It would be worth while to match the fragment found here in the historic kiva with those on the mesa if they can be found, as it might verify Bandelier's opinion about an interesting historical question.



because of its apparently fine state of preservation and also because it was small in size and distinctly separated from adjoining structures. Surface appearances proved somewhat deceptive in the end. The expected regularity and simplicity of construction was not fully realized, but nevertheless the undertaking was well repaid. The ruin was an oblong heap of about 40 by 80 feet, with the long axis turned east and west. Its surface was extremely uneven, owing to the standing walls and deep hollows which marked several of the rooms. In one place, however, the ceiling beams were still supporting the debris of the upper story masonry and it was possible to enter the open chamber (No. 8) underneath through a side wall. It was hoped that several such open rooms might exist, where perhaps furnishings, pottery, etc., would be found intact, but this was not the case. The groundplan shows what was found when all the rooms had been cleared, viz., a rectangular structure 5 rooms wide and 5 rooms long, with 2 additional chambers added on to the northwest corner. Judging from some buttress-like projections found attached to the east end wall, it is possible that the building was originally longer than when last occupied.

The excavation brought out a peculiar complex of facts. In the first place the site on which the building stands was neither smooth nor level. The original mesa surface dipped southwestward, but this slope would have cut little figure in comparison with the deposition, on the lower side, of a refuse heap, which was found to extend beneath rooms 1-10, as well as beneath the northeast corner rooms excavated in the adjoining wing of building IX b. Crowded with burials, the mound could not perhaps be disturbed or leveled off so as to produce the ideal building foundation. At any

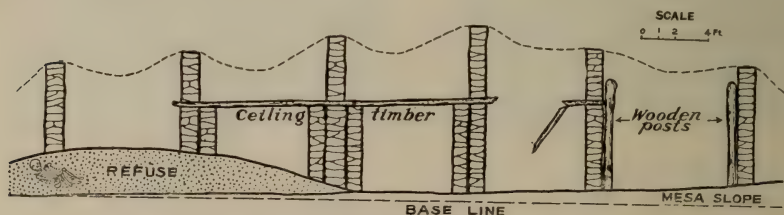


Fig. 7. Slightly generalized Cross-section about Midway on Building X, San Cristobal, showing the Relation of the Building to a Refuse Heap, also the Height of the Ceiling and how it was Supported by Additional Walls, Posts, etc.

rate the bases of the walls do not lie in a horizontal plane or any other sort of plane, but conform to the sloping and generally uneven surface. In the second place there was visible proof that the central part of the building had been two stories high, because the ceiling was in place and the walls rose 3-4 feet above it. (See Fig. 6.) But there was no positive evidence of a second

story to the outside rows of chambers, or even of a roof. A roof, or ceiling, there must have been, no doubt; but it could hardly have been on a level with the ceiling of the central rooms, at least not on the south side of the building, because there would here have been no standing room underneath it. The peculiar conditions are exhibited in the slightly generalized cross-section of the building shown in Fig. 7. Here it will be seen that while the three right-side walls were founded on the surface of the sandstone mesa the three left-side walls rested on refuse from 1 to 3 feet deep. The ceilings of the central rooms are seen to be about 5.5 feet above the native stone floor. Now if this ceiling was brought out to the left on the same level, the room beneath would be less than 3 feet high, allowing 3 to 4 inches for the adobe floor; and if extended to the right, some of the rooms there (not all) would be less than 5 feet high. Another feature of interest is a number of secondary walls (sometimes replaced by upright wooden posts) roughly piled up on either side of the central rooms as if to support the ceiling timbers, the original walls being too weak. This made the lower chambers so narrow as to be practically useless. Some upright posts were also found in the exterior rooms on the right (north) side of the building, but whether these served as ceiling supports or for some other purpose could not be determined. There is thus room for opinion as to the precise exterior lines of the finished building, but there can hardly be a doubt about the meaning of the patched-up condition of the lower central chambers. The building must have stood empty for a time, or else it became insecure, owing possibly to the poor foundation. In either case the last inhabitants found it necessary to strengthen the lower story in order to make the upper story secure.

Inasmuch as the building was entirely cleared and cannot be considered at any future time, some detail features must be mentioned. The size of the rooms, as may be seen in the table of measurements, accorded closely with the general average for the entire pueblo. The walls were weak, being constructed in part of small and somewhat friable blocks instead of large thin plates of stone.<sup>1</sup> Some had fallen completely, as on the southeast corner, and others leaned far out of plumb. Not a single doorway was discovered, but there were several small rectangular insets or niches in the walls of the upper rooms. One of these insets, in room 13, measured 13.5 inches horizontally, 15.5 inches vertically, and 9 inches in depth. It was faced on all five sides with slabs of stone. The walls of the upper rooms were plastered and showed, some of them, 3 to 4 successively blackened coats of whitewash. In the lower rooms there was no whitewash and

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<sup>1</sup> Metates and manos, or mullers, were embodied in the masonry of this and several other buildings of the pueblo.

seldom any plaster. Fireplaces were not in evidence on either floor, but ashes were noted in several rooms. The ground floors, except where the native rock surface of the mesa served the purpose, were made of adobe, but the material was dissolved, i. e., it was in such a soft state as not to be distinguishable from ordinary loose earth. In fact no floors could be detected in the rooms underlaid by the refuse heap. The ceiling was made in the customary way. Beams of cedar, sometimes piñon and even cottonwood, measuring 4 to 8 inches in diameter, were laid across the rooms, fully 18 inches apart. Some of these timbers had been chopped with a dull tool, perhaps a stone axe; others were charred at the ends as if they had been



Fig. 8. View of Room 13, Building X, San Cristobal, showing Details of Ceiling Construction. See also Fig. 6.

burned down to proper lengths. All were blackened by smoke on the under side. Resting on these beams and placed close together was a series of thin poles (diameter 1-3 inches) and split rails of piñon and cottonwood, which often extended through the end walls into the adjoining rooms. On top was strewn a layer of reeds, twigs with leaves adhering, etc., and the whole was covered with adobe (Figs. 6 and 8). In room 12 the adobe surface of the upper floor bore evidence of having been carpeted with an even layer of pine bark.

Numerous artifacts, some pottery vessels and a tremendous quantity of animal bones, as well as a large series of human remains representing all



ages, were recovered from the debris of building X. Besides the specimens of native manufacture, several fragments of sheet copper were found. Among the animal bones were a number of horse heads, young animals, that bore marks of having been killed by a blow between the eyes. The human skeletons, it must be explained, were found, not in the rooms proper, but underneath in the refuse heap. Most of the pottery vessels were found in the lower chambers and while they were made perhaps in prehistoric times, it is impossible to say that they were not used at a much later date. An interesting discovery was made in room 1. There were here in the northwest corner the remains of a small chamber, ca. 3 by 3 feet in size, enclosed by adobe walls still standing in part to a height of 2 feet. Within the chamber were the osseous remains of three eagles.

*Building XI.* The mound so designated joins the west wing of building XV but is probably not a part of it. Only one room was excavated and while it yielded many interesting facts it will be necessary to pass over the subject matter briefly. The building was two stories high and seems to have been rehabilitated somewhat after the manner of its neighbor, building X. From the charred condition of the timbers found in the debris it seems probable that the structure was burned. Metates, cooking stones, numerous thin rectangular slabs of sandstone with dressed edges, polishing stones, potsherds, animal bones, etc., were uncovered. The building is of historic date.

*Buildings XII, XIII, and XVII.* By the time buildings I-III, VII, IX and X (these being the first to be investigated) had been excavated or thoroughly tried out, it had become tolerably clear just what constituted the difference between historic and prehistoric remains. Furthermore, building VII had shown that there were prehistoric ruins on the north side of the creek and surface indications bespoke the presence of others, Bandler's assertion notwithstanding. To make sure on this point it was decided to clear a promising ruin or two some distance away from the center of the pueblo and buildings XII, XIII, and XVII, on the southeastern extremity of the village, were accordingly chosen. The work was not carried to completion, only 26 rooms being cleared, because it soon became evident that they were indeed prehistoric ruins, perhaps as old as any of those south of the creek. That fact made certain, it seemed best, in view of the intended scope of the field-work, to bring the investigations at San Cristobal to a close by merely testing the various untouched ruins for clues to anything new or unusual.

The three buildings under consideration presented no absolutely unique features. They had all been relatively small and simple structures. Nothing positive can be said about building XVII because, as previously stated,

the debris had been removed until the walls rose barely 2 feet, but the other two buildings had certainly been two stories high. It must be admitted, however, that there were present only the faintest indications of ceiling timbers. Most of the rooms were of normal size and regular outline. The floors, where not made by the underlying native rock, were of adobe. The walls were built of stone slabs laid in mud and were generally in fair condition.<sup>1</sup> Plaster and whitewash were noticeable in a few chambers, at least in buildings XII and XIII. Some of the walls were also blackened. Doors were found in the north walls of rooms 2 and 4 of building XII, measuring 15 by 15 inches and 14 by 18 inches respectively. A single fireplace (Fig. 9)



Fig. 9. View of a Typical Fireplace, found in Room 12, Building XIII, San Cristobal.

occurred on the floor of room 12, building XIII, midway on and against the east wall. It was lined with stone slabs on all sides, as well as on the bottom, and was full of ashes. The horizontal inside measurements were 13 by 21 inches and the depth 9 inches. The run of specimens was much like that of the ruins on the south side of the creek. Few burials occurred and no domestic animal bones were recovered, likewise no greenish glazed pottery. A black corrugated jar with cover was found standing on the floor in the

<sup>1</sup> There is a two-foot jog in the east wall of room 3, building XIII, which has not been indicated on the groundplan.

northwest corner of room 5, building XII, and a similar vessel stood in the southwest corner of room 12, building XIII.

*Buildings XIV-XVI.* As will be observed on the groundplan of the pueblo, the buildings under this heading were merely tried out by the excavation of two or three rooms in each separate structure. The work done was however sufficient to answer the most important question concerning them, viz., their historic or prehistoric origin. Buildings XIV and XVI, like V-VII and also those referred to in the preceding section, were no doubt in ruins before the establishment of the pueblo of mission days. The same appears to be true also of a large part of building XV, but not of all of it. The western wing of this structure, adjoining building XI, furnished evident proof of historic occupancy and must be grouped with buildings VIII-XI as part of the historic pueblo. To go into details at this time about the eight rooms here cleared of debris seems unnecessary as there is nothing new to be said.

*Refuse Heaps.* The readily visible accumulations of ashes and other debris scattered about on the outskirts of the pueblo have already been mentioned in the general description. In addition it was pointed out later on that parts of buildings I, VIII, IX and X were founded on deposits of the same nature, but deposits which were not visible on the surface outside the buildings in question as in the case of building VII, which stands on the east end of refuse heap C. The hidden refuse heaps were accidentally dug into before their real nature and their relation to the superimposed buildings were fully comprehended; hence the results obtained from them are not entirely satisfactory, owing to the possibility of artifacts from the buildings and from the refuse beneath having become mixed. The refuse, made up largely of ashes, potsherds, animal bones and presumably other waste debris, was everywhere rich in burials. These burials antedated, at least in some and probably in most cases, the construction of the buildings above them and were as a rule in a poor state of preservation because of the unnaturally moist condition of the debris. In the case of the visible mounds the contour permits the rains to drain off quickly and the debris here is consequently kept dry as powder from the bottom to within a few inches of the surface. With a view therefore mainly to securing a series of good skeletons, trenches were opened in all but one of the larger deposits. Unfortunately, nearly all of this work was done immediately before quitting the pueblo and as a result in some haste. Fully 6000 cubic feet of material was handled and quite a number of skeletons, as well as artifacts of bone, chipped flint, etc., were obtained. In addition the workmen threw aside all fragments of stone and pottery and the examination of the latter revealed differences in kind, as between mound and mound, not indicated by the



surface specimens. In other words, while there is little variation in the nature of the glazed pottery found in the excavated ruins, there is a decided difference, both in general finish and in ornamentation, exhibited by the sherds found in the refuse heaps. Pottery of the general style found in the ruins is confined to the refuse deposits on the north side of the creek, while in mounds A and B there are remains of a different and really finer type of ware, which is unquestionably the older of the two. Opportunity was not afforded to take up careful stratigraphic work, but there can be no doubt that these refuse heaps are worthy of further study for chronological purposes.

#### RESULTS AND CONCLUSIONS.

In view of the prospect of further investigations at San Cristobal in the near future it is useless to try to say the last word at this time. Nevertheless, it may be well to summarize what has been accomplished to date and to state such conclusions as the facts at hand seem to warrant.

The work at Pueblo San Cristobal, besides mapping the ruins, included the excavation of 239 ground floor rooms. One kiva was completely cleared and two others were tried out. A watch tower, if perchance it is not another kiva or shrine, was also cleared. Some digging was done in all but one of the seven principal refuse heaps and, lastly, two near-by rock-shelters were investigated to the extent of determining their relation to the pueblo. As a result of this labor 1016 complete artifacts, belonging to about forty different types, were recovered. To this figure might be added also 1191 incomplete artifacts (mostly of stone), several bushels of potsherds and of animal bones, and lastly 131 human skeletons.

The main problem to be settled was the location and extent of the historic part of the pueblo. This is located directly above the chapel, somewhat central in the group of ruins on the north side of the creek, and has been differentiated on the groundplan by heavier shading. Twelve buildings or wings of buildings are included and their combined capacity is estimated at about 650 ground floor rooms. However, some of the buildings, though apparently not all of them, were more than one story in height and it would be fair, no doubt, to increase the capacity of the historic pueblo by almost one-half, i. e., to about 975 rooms. Now if all these rooms were habitable at the same time they ought easily to accommodate 800 people, the number of inhabitants attributed to the village in 1680 by Vetancurt and Bandelier (see note, p. 36). Some doubt is thrown into the problem, however, by an appreciable difference in the state of preservation of the ruins concerned and until this entire section of the pueblo has been excavated it will be profitless to take sides in the historic question at issue.

The investigation, it will be evident, was not exhaustive. It was not intended to be. The work was dropped almost as soon as the main facts about the pueblo and its history became clearly discernible. That point was not reached, however, without the expenditure of considerable time and labor, and the knowledge thus obtained was made to serve as a key to the study of the other pueblo ruins in the Galisteo region.

In conclusion, if all the suggestive facts be taken into consideration, such as the number, size and variation in the nature of the refuse heaps, the construction of buildings on top of several of these deposits, the burial of ruins underneath refuse heaps, the superimposed ruins, and the incorporation of worn-out or useless metates, mullers, etc., in the masonry of several buildings, it is possible to affirm with some confidence (1) that Pueblo San Cristobal is an old settlement, both relatively and absolutely; (2) that the village grew from small beginnings; (3) that the center of habitation shifted back and forth from time to time; and (4) that, in all probability, the whole pueblo was never at any time fully occupied.

## PUEBLO LARGO.

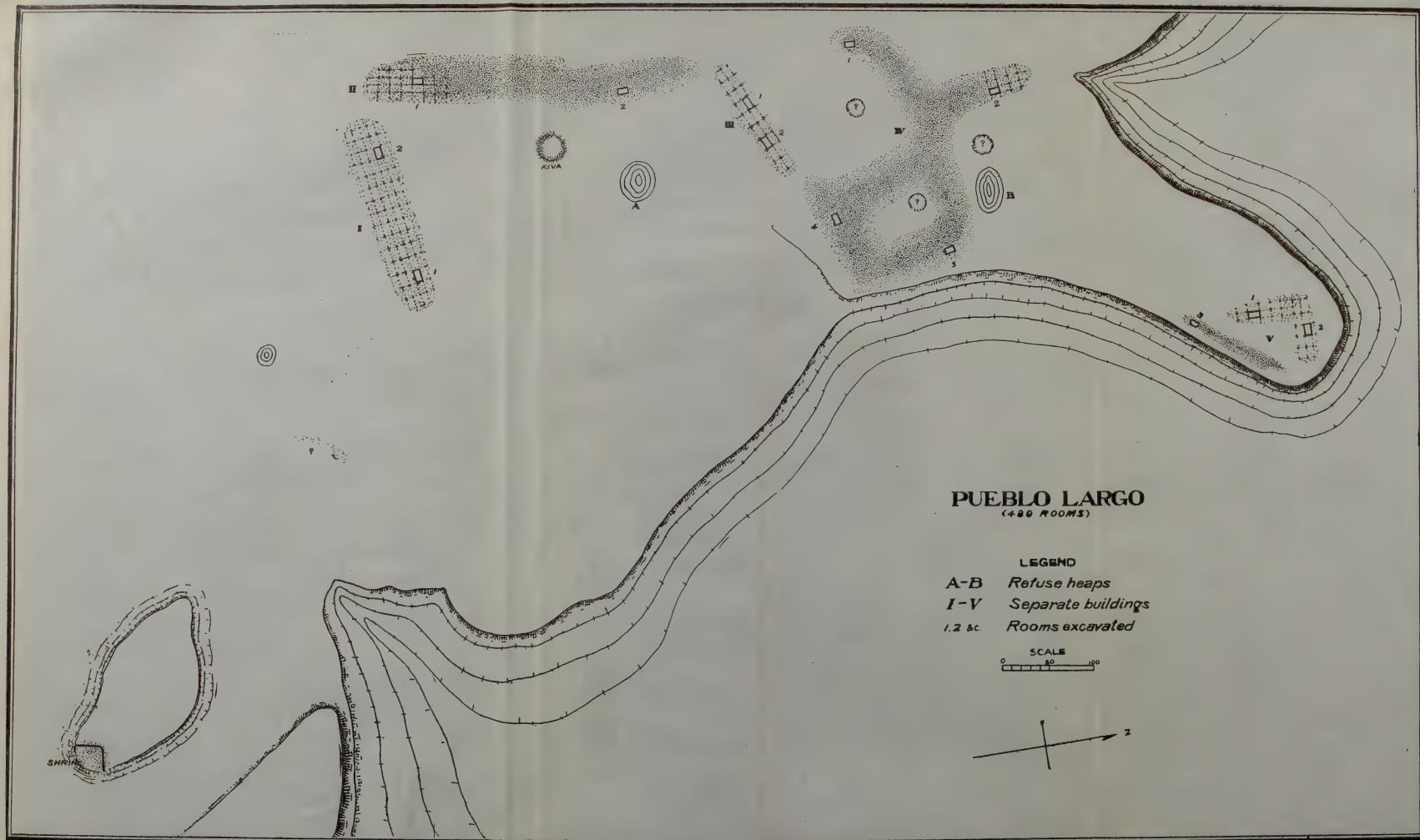
From the San Cristobal ruins and extending directly southward for about seven miles or more is an open meadow-like ravine perhaps half a mile wide on the average. This grassy plain rises somewhat gradually to a forested mesa on the east, but on the west it is bounded for the most part by a rather abrupt escarpment. Between four and five miles south of San Cristobal and on the extreme edge of this western escarpment lies Pueblo Largo, or Long Village.<sup>1</sup>

## SITUATION.

The situation of this, the smallest of the Galisteo pueblos, is somewhat striking, as may be judged in part from the appended groundplan (Plan II). The buildings lie on a sloping though partly uneven surface and fall, roughly speaking, into three groups. Of these the two large separate ruins at the southern extremity lie on smooth ground and some distance back from the escarpment; two other small ruins, at the northern extremity, lie out on the tip end of a prominent spur of the mesa, on slightly higher ground, while the center group of buildings is situated at the commencement of this mesa spur, on the highest elevation and about as close to the edge of the steep declivity as it could well be. Only a part of the escarpment presents anything like a vertical exposure, most of it being simply a steep and rather difficult talus slope, except at the indentation off the south end of the pueblo where an easy trail leads down. The exact height of the declivity was not ascertained, but while it varies somewhat in different places it is probably nowhere much over 100 feet. To the west and south of the pueblo is a semi-forested plain with interspersed open stretches, sloping gently westward for about three-quarters of a mile to the next rising escarpment.

<sup>1</sup> This ruin is not particularly well known to the Mexican residents of the Galisteo country. Some call it Pueblo Estacado, after the long ravine below it on the east, and others refer to it as Pueblo Largo, a name which the site merits better than any other ruined village of the Galisteo group on account of the disposition of its buildings. The pueblo is located on Senator Pankey's ranch and is specifically named Largo on the old maps of his estate, for which reason I have ventured with some hesitation to let that name stand, even though Bandelier has applied the name Largo to an entirely different ruin. The Largo of Bandelier, or, as called by the Tanos, "Hishi" (see Bandelier, Final Report, p. 106), is located ten miles away on the southwestern extremity of the Galisteo basin. This last-named site was spoken of by some local residents as Pueblo Largo, to be sure, but others knew it as Pueblo Blanco, presumably on account of some whitish rock exposures in the vicinity. I have therefore, at the risk of causing some confusion, named it Blanco.







Here, at the southern extremity of a red sandstone spur, were found traces of a spring (called Pueblo Spring on the map of the Eaton Grant), and on the smooth rock exposures in the vicinity are a number of interesting pictographs. On the plain itself, between this spring and the ruin, there are also a few water holes, and similar water holes can be found on the flat bottom of the narrow valley below, i. e., to the east of the ruin. No artificial reservoirs were discovered, however, and one is forced to conclude that unless some good spring lies choked up in the vicinity the people of Pueblo Largo might have been hard put to it for water at times. Parts of either the upper or lower plain might perhaps do for agricultural purposes, but on the whole the site is not attractive, except from a military point of view. The outlook is good in all directions and it would have been extremely difficult for an enemy to have surprised the pueblo.

#### GENERAL DESCRIPTION.

*Communal Buildings, Kivas, and Refuse Heaps.* Pueblo Largo comprises only six separate community houses. Three of the buildings are very small but the other three attain considerable proportions. The estimated capacity of the village is 489 ground floor rooms; and this figure, as usual, can safely be increased by about one-half for upper story chambers. A dense growth of cactus covers all of the buildings, owing probably not so much to any fertility that the tumbled masonry possesses as to the nooks and crannies it offers where rodents may hide their winter supplies of cactus seeds. Ruins III and V (the latter really two separate structures) look as if they had been dismantled or else are much older than the other buildings, though the latter assumption is not clearly borne out by the nature of the pottery found in them. Building I is a simple rectangular structure, five rooms wide and fifteen rooms long. A good many of the corner walls still protrude above the general level of the debris, so that it is not difficult to estimate the number of ground floor rooms. Building II, lying nearly at right angles to I and separated from it by a gateway, is considerably larger, but its walls are not visible except at the southern extremity. There is a jog in the outline towards the north end, suggesting that the building was constructed in two sections. Building IV is a curiously shaped combination of parts, controlled in their disposition largely by the elevated nature of the topography. The four easternmost wings enclose a small court. Between buildings IV and V there is a depression, most marked on the west side of the mesa spur. In fact the various parts of the group called building V do not lie on the same level. Thus, e. g., the northernmost wing is built up



against a slight escarpment, perhaps five feet high, in such a way that the inner row of rooms lies at the base of the natural wall while the outer rooms, including No. 2, lie on top of the escarpment.

There are traces of one semi-subterranean kiva and this is located close to and midway on the east side of building II. It had a diameter of about 30 feet and was constructed at least in part of stone. There are three other hollows in the wholly or partly enclosed courts of building IV, but that they were really kivas is highly improbable.

Refuse heaps are not much in evidence about the pueblo, though potsherds, chipped flints, obsidian, etc., are freely scattered all about the premises. The deposit marked A is so small as to be practically negligible and mound B does not make much showing either, though it may well be larger than the surface appearances indicate. Time did not permit their examination.

*Shrine.* About 600 feet to the southeast of the pueblo proper, on the edge of a flat-topped hillock, there are to be found the remains of what may no doubt be called a shrine. The hill in question is strictly speaking a bit of isolated mesa with a solid stone cap, and the fairly steep talus slope leading to the top is some 25 to 30 feet high. The shrine is located on the extreme southeastern edge of this mesa, partly on top and partly on the slope below. A roughly constructed stone wall rises from 2 to 4 feet on the west and north; but of the south and east walls, which were built on the talus slope itself, practically nothing remains standing. The enclosure has been probably about 25 feet square. The floor is quite uneven, being made up of a series of ledges in the scaling rock foundation. Entrance to the place was evidently effected through the east wall, and directly opposite, close to the west wall, stood a large sandstone slab on which was a well-preserved, graven, human-like image. The slab, as shown in the accompanying illustration (Fig. 10), has a visible height of 7.5 feet, is 2.5 feet wide and barely 3 inches thick. Although extending only 1.5 feet below the surface, it stood nearly upright, being firmly wedged into a crevice in the rock floor. Its surface was partly covered with lichens.<sup>1</sup> The outlined image was not pecked into the rock but was rubbed or ground, the line being smooth and shallow but perfectly definite, excepting for the hands which seem not to be present. Stiff and somewhat lacking in proportions, the figure (3 feet 9 inches high) is nevertheless interesting, particularly so on account of two

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<sup>1</sup> A stone slab of such proportions, it would seem, must have been not only hard to handle but difficult to obtain. There is, however, a small ledge of the same kind of stone cropping out only about a quarter of a mile to the west. The cleavage here corresponds closely to the thickness of the shrine slab so that very probably it was quarried in this place. The specimen was trimmed off at the top and bottom and brought to the Museum.

horn-like projections on the head, two additional pointed projections on both sides of the lower part of the trunk and, lastly, a deep and well-defined slit in the center of the chest. Precisely who or what the figure represents or whether it is unique, the writer is not prepared to say.<sup>1</sup> Traces of a similar



Fig. 10. Partial View of Shrine at Pueblo Largo, showing some of the Standing Wall and also a Large Figured Stone Slab. Pueblo Colorado lies at the Base of the Distant Cliff.

figure were found on a smaller slab which lay broken in pieces on the floor of the shrine. The largest fragment is set up in the right of the illustration and shows the right shoulder and arm. Another large lichen-covered slab, found set into the ground but leaning hard to the left, may also be seen. No inscription could be discovered on its surface.

Inasmuch as there was practically no soil within the limits of the shrine, excavation could yield nothing. The interior was nevertheless cleared of slabs and debris as far as seemed worth while, but nothing was found save a few curiously shaped rocks mostly of the nature of concretions. These lay buried close to the standing slab and were presumably fetiches.

<sup>1</sup> Espejo mentions numerous idols and also some chapels located on high places in the Rio Grande country, so that the discoveries here and in some of the following pueblos seem to verify his observations. See Hakluyt Voyages, p. 393.

## EXCAVATIONS.

Owing chiefly to the difficulty of obtaining water for camp use in the vicinity of Pueblo Largo, no more labor was expended on the site than was absolutely necessary. Two or more rooms were excavated in different parts of each of the buildings and when the resulting finds showed beyond a doubt that the culture represented was identical with that of the prehistoric San Cristobal the investigation stopped. Only a few items need be mentioned. The walls were found to stand from 2 to 7 feet in height. Having been built of choice, i. e., large, thin, stone slabs, which occur in unlimited quantity on the adjacent talus slope, all the standing masonry was generally in fine condition. Some plaster remained in several of the rooms, but whitewash was not detected. There was a doorway in the south wall of room 1, building I, 8 inches above the floor and measuring 1 by 2.5 feet. Likewise in room 2, building II, there were framed doorways or openings in the east and west walls, measuring 1 foot 2 inches by 2 feet 9 inches and 1 foot 5 inches by 6 inches respectively. The few rooms excavated varied somewhat in size but were all approximately rectangular with the exception of No. 3 in building V, which had two of its corners beveled off. No fireplaces were found though some walls were blackened, and in room 1, building IV, there were some charred timbers as well as over a half bushel of carbonized maize of good quality. Some of the plaster in this room was burned a brick red, an evidence of unusual heat suggesting that perhaps that part of the pueblo was burned.

## RESULTS AND CONCLUSIONS.

The transportable collections obtained from the clearance of 13 rooms were of course not large. Only 48 complete artifacts were recorded, but to these could be added 13 incomplete specimens, besides a small quantity of animal bones and a somewhat larger quantity of potsherds illustrative of the glazed, painted, and corrugated wares. No pottery vessels were found intact, though a large, partly broken and possibly complete jar of the corrugated type was found in room 1, building I. The rest of the finds included metates, manos, polishing stones, grooved axes, and chipped points of flint, obsidian, etc. Only two burials were noted.

The only pertinent conclusion to be drawn from the hasty examination



of Pueblo Largo is that the settlement is of prehistoric date.<sup>1</sup> But while this is unquestionably true, the nature of the pottery and the general state of the ruin lead one to believe that the settlement cannot begin to compare in age with Pueblo San Cristobal. In other words — and this is also suggested by the lack of refuse heaps — Pueblo Largo cannot have been occupied for a very long period of time; and the indications are not wanting that its abandonment was forced by some human agency.

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<sup>1</sup> Probably the site was never seen by Spaniards or the shrine image would most likely have been destroyed.

## PUEBLO COLORADO.

The next ruin to be considered is located about two and one-half miles southwest of Pueblo Largo, at the base of a towering cliff. The site is most easily reached by going down the broadening plain to the west of Largo, but even here it is next to impossible to find passage for a vehicle on account of the numerous deep gullies that intervene. One enters gradually a roundish, meadow-like depression, which is a sort of Galisteo basin in miniature, with drainage outlet also to the west through a deep, narrow canyon.<sup>1</sup> And at the point where the main stream channel of the small basin enters its funnel-shaped gorge lies the ruined village, known as Pueblo Colorado<sup>2</sup> on account of the strikingly red color of the sandstone of which it was built.

## SITUATION.

Picturesque above all in its immediate surroundings, Pueblo Colorado also bears witness to the strategy and good judgment of its founders. The ruins lie on an easy, somewhat exposed slope perhaps four hundred yards from the right bank of the main arroyo and nearly three hundred yards away from the base of a 250 foot cliff or escarpment presented by the high and rugged mesas extending away to the north (see general map, p. 36).<sup>3</sup> The situation affords only a limited view, even to the southeast, in which direction it is open for some distance; but for all that the place is by no means insecure. Attack could not, e. g., be made from the north, while at the same time the top of the cliff directly above the pueblo furnished a good lookout point, as may be judged in part from Plate 2. But the site was hardly chosen on account of its military strength, if one may speak in such terms, the chief secret being rather the presence of an excellent spring which issues at the head of a deep canyon, or indentation in the cliff directly to the northwest. And it is precisely in this connection that military sagacity is

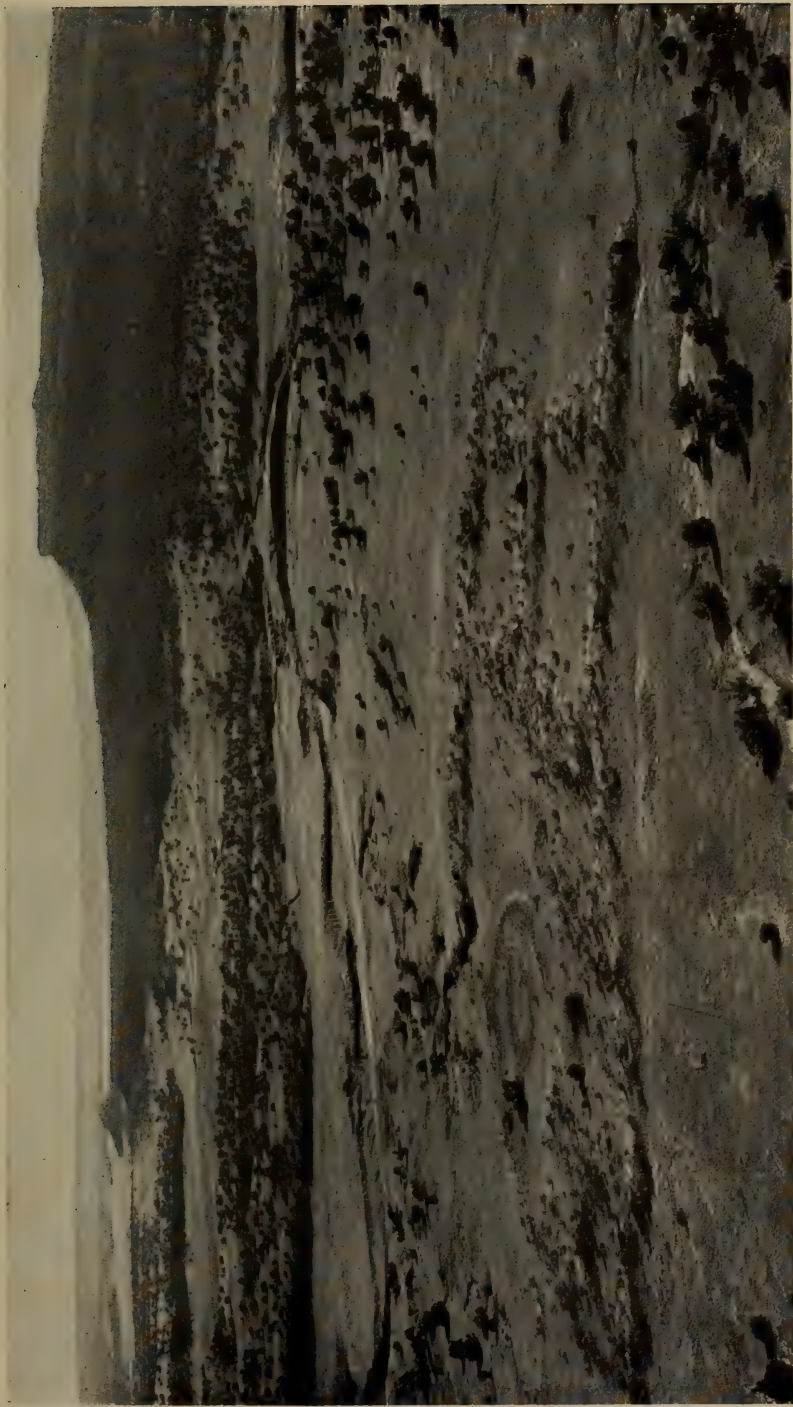
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<sup>1</sup> The basin, which is included in the Pankey Ranch, is known locally as El Chico and the main stream (really the headwaters of the Arroyo Jara) down to its emergence on the Galisteo plain, about 1.5 miles below Pueblo Colorado, is sometimes referred to as Chico Creek, the canyon itself being called Cañoncito Colorado.

<sup>2</sup> Bandelier (Final Report, II, p. 106) gives the Tano name of the village as Tze-man Tu-o.

<sup>3</sup> Attention is called to the fact that the symbol for Pueblo Colorado is not quite correctly placed on the map. The village should be more to the southwest, i. e., about half way between the escarpment and the creek.

74



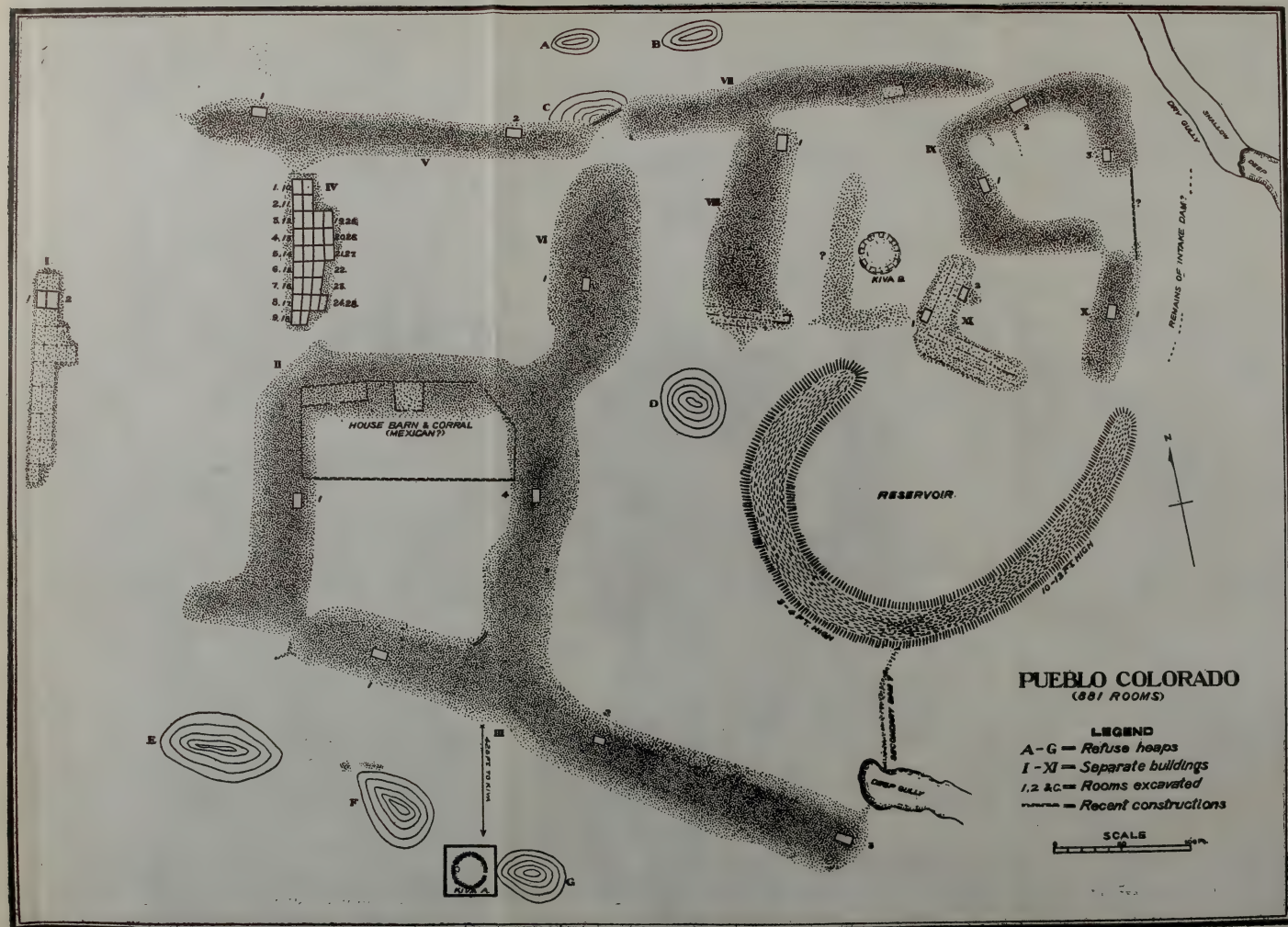
PUEBLO COLORADO

General view from a high cliff looking across the ruins in a southwesterly direction. All except building I (on the extreme right) are covered with cacti and are easily distinguished.

(Page 74)











displayed. The spring is a quarter of a mile or more away from the pueblo and it furnishes the only good water in that region, the flow in the creek being uncertain as well as decidedly alkaline. If economy alone had been consulted the pueblo would have been located back in the sheltering canyon, near the spring. There was some fuel timber here and building stone would have been as handy as where the pueblo now lies. However, had the pueblo actually been located back in the canyon referred to, no outlook would have been possible and no watch could have been kept on the corn-fields bordering the creek below; what is more, it would have been the easiest thing in the world for an enemy to have bottled up its inhabitants and starved them out because the sides of the canyon rise like immense cathedral walls and could not have been scaled in any attempt to escape.

#### GENERAL DESCRIPTION.

*Communal Buildings.* Pueblo Colorado is represented on the accompanying groundplan (Plan III) as being made up of eleven distinct communal buildings disposed in such a way as to enclose at least four separate courts.<sup>1</sup> Some of these buildings are straight and simple in outline while others are composed of two, three, and even four wings; but it is by no means impossible that future excavations may show the actual number of free-standing houses to be either more or less than the given estimate. Examining the ground-plan it will be noticed at once that the various buildings differ markedly as to width, size, and even as to general trend of orientation. That is, there is, so to speak, a lack of unity among the various parts of the pueblo. There is also a noticeable difference in the state of preservation of individual ruins; buildings I and XI, e. g., have been dismantled so that the remaining walls stand only 2.5 feet high, against 7 feet or more in some of the other buildings. The meaning of all this has not become clear, however; and so, irrespective of any possible succession of habitations in the pueblo, its total capacity has been placed at 881 ground floor rooms. But nearly all of the buildings must have been two stories or more in height, thus permitting a considerable increase of housing facilities. Substantial walls spanned the gaps between buildings V and VII, likewise between IX and X, and these no doubt date back to aboriginal times. But some recent settler must be held responsible for the remaining walls of what appears to have been a house and barn, with corral, to be seen on top of and adjacent to the north wing of building

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<sup>1</sup> There are faint traces possibly of another building lying between buildings VIII and XI.

II.<sup>1</sup> In general appearance the Colorado ruins vary but little from those of the neighboring pueblos, unless perhaps they are more prominent. One noticeable feature is that the walls in many places appear to have fallen en masse, because large sections of the masonry lie precisely as put up, but in horizontal positions. Cactus bushes cover all except the two dismantled buildings.

*Kivas.* A circular shrine or kiva (A), 21.5 to 22.5 feet in diameter, is located off by itself some 425 feet west-of-south of the main pueblo. It lies close to a slight declivity and on a solid rock foundation. The place was therefore not subterranean, while at the same time the debris present is insufficient for the construction of a wall more than possibly 2.5 feet in height. A few of the lower courses of this roughly piled stone wall still lie in place and a doorway through it is definitely fixed, on the east side, by two large standing slabs set 2 feet 9 inches apart. These framing slabs are fully 3 feet across (i. e., slightly broader than the wall itself) and stand to a height also of about 3 feet. They are kept in place at the bottom by a similarly broad horizontal slab forming the sill, but incline to 1 foot 6 inches at the top, and probably intentionally so. On the left hand face of this door frame is pecked a circle 19 inches in diameter, and some irregular figures have been cut on the door frame opposite. The entrance had apparently been closed from the inside by another slab, which still stood in place, though it is possible that this particular stone may have been the top of the door frame fallen down across the inside of the entrance and kept in an upright position by other debris. Directly opposite the entrance, close to the back wall, stood a leaning slab measuring about 3.5 feet square and without detectable inscriptions of any kind. In order to obtain possible clues to the function of this ruined structure, a shallow trench was cleared along the inside of the wall and another from the entrance across the center to the large standing stone slab. From these excavations were obtained several potsherds, a fragmentary mano, over 40 rather oddly shaped but waterworn boulders, some quartz pebbles, some smoothened pebbles of iron ore, some nodular concretions, a small stone disk, a large stone disk, and finally an angular slab of sandstone ca. 15 by 19 inches, with several artificial perforations worked from opposite sides. Nearly all of these specimens were found in a heap close to the standing slab. The sum of the evidence seems on the

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<sup>1</sup> Little attention was paid to this ruin, which seemed so clearly to be of Mexican origin, until one of the workmen reported that some Indians from the pueblo of Santo Domingo had made a temporary settlement at Colorado some sixty or seventy years ago. No one could substantiate the story or furnish any particulars, however; but some color was lent to it afterwards by the fact that in clearing a portion of the house there were found fragments of a glazed pottery vessel of the type characterizing the historic pueblo ruins, such as San Cristobal, San Lazaro, and Galisteo.

whole less suggestive of a typical kiva than it does of a shrine like that already described at Pueblo Largo.

A circular hollow appears to mark a real subterranean kiva (B) in the court partly enclosed by buildings VII-IX. The approximate diameter was 38 feet and at three different points in the perimeter stood a short, thick and much weathered post, probably either of pine or piñon. The tops of these posts, rising a foot or so above the surface, were cut squarely off. On being dug out, the largest and best preserved was found to be practically rotted away below ground, but traces of it could be seen to a depth of fully 2 feet. The matrix surrounding the post was pure adobe and no traces of stone walls or anything else artificial could be found on the edge of the hollow. It may have been a kiva in process of construction, but in any case the wooden posts still remain a mystery.

*Refuse Heaps.* Seven refuse and burial mounds were noted about the ruins, one of them (D) being within the limits of the village proper. Excepting C, none of these deposits were over a foot or two in thickness, and while they were tried out in a superficial way to learn something of their depth and general nature, there is nothing of importance to be said about them.

*Reservoir.* It seems that the inhabitants of Colorado did not choose to rely on their nearby spring alone. Perhaps it was a little too far away, except for emergency purposes. At any rate, they expended a good deal of labor in constructing a semicircular reservoir within the large court on the lower east central side of the pueblo.<sup>1</sup> The tank is now silted up to a considerable extent and the dam has been washed down on the south side; but along on the necessarily highest east side it still rises 10 to 12 feet above the natural surface. It is built mainly of adobe but also in part of stone slabs set on edge. The manner of filling the reservoir seemed a puzzle at first, but a few faint traces of what must have been an intake dam were finally discovered connecting the reservoir with a small dry gully which drains a portion of the nearby talus slope and passes close to the northeast corner of the pueblo on its way to the main arroyo (Plan III). In this way the flush of the summer showers was easily conserved, though the altered topography would make the feat difficult today. The overflow from the reservoir went over the south edge of the dam and into the court, where it was caught in another gully touching the southeastern corner of the pueblo.

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<sup>1</sup> See Plate 2, as well as the groundplan.



## EXCAVATIONS.

*Building IV.* After having tried out all of the pueblo by the excavation of 20 scattered rooms, it was finally decided to clear building IV. This was a small structure distinctly separate from any other building and relatively free from cacti. The work occupied less than a week and the architectural results laid bare have been made tolerably clear on the general ground-plan. The building turned out to be 10 rooms long and 2 to 4 rooms wide, with a total capacity of 28 ground floor rooms. From the appended tables of measurements the chambers will be seen to have been seldom rectangular and on the whole narrower and at the same time longer than usual, the average for the building being 6 feet 2.04 inches by 11 feet 3.45 inches. The walls, consequently not quite straight nor parallel, were almost uniformly less than 1 foot in thickness (range 8-12 inches) and stood to a height ranging from 2.5 to 5 feet. They were built in the usual way, of stone slabs laid in adobe, and were fairly substantial. A considerable amount of mud plaster remained in place, and in rooms 13 and 17 there were traces of white-wash. In several other rooms the walls were blackened, though fireplaces were found only in rooms 18 and 27. The hearth in room 18 was set into the floor and against the east wall. It was framed with stone slabs and measured 14 by 20 inches. One of the conventionally shaped stones that serve to support the cooking slab was still in position and the place itself contained 6 inches of ashes. The other fireplace, in room 27, was likewise framed but was raised on a 4-inch platform in the center of the room and adjoining it in the northeast corner was a large bin partly filled with ashes. The floors themselves were flagged with stone in a few rooms, but generally they consisted of hard adobe, more or less cracked and blackened. No less than 11 doorways were found connecting inner rooms and a twelfth door was found in the outer wall of room 3. These openings, sometimes framed and sometimes not, were all a foot or so above the floor level and ranged in size from 9 by 22 inches to 20 by 36 inches. None of these details were entered on the groundplan because the reduction would make them indistinct.

Most of the preceding details could be repeated for any one of the other buildings, but no new data would be added that have not been brought out in the tables of measurements. Hence description of these merely tried-out ruins may be left to the future.

## RESULTS AND CONCLUSIONS.

From the 47 rooms excavated at Colorado there were listed 385 complete artifacts and almost an equal number of broken or incomplete forms. As an example of how the material runs in these pueblos, it may be stated that the 385 complete specimens included 35 metates, 122 manos, 8 cooking slabs, 33 rectangular dressed slabs, 11 circular slabs (pot covers?), 11 rubbing-and-hammer stones, 16 polishing stones, 19 fine grooved axes, 9 grooved arrow-straighteners, 5 chipped flint points, 3 shell pendants, 7 pointed implements of antler, 5 chisel-like bone implements, 17 bone awls, 4 bone flutes, and 3 pottery vessels. The pottery vessels were small and of the glazed variety, but of no particular interest. Sherds<sup>1</sup> and animal bones, quantitatively speaking, ran about as usual. Six incomplete human skeletons were found, some in refuse heaps C and D and some in room 1, building IX, beneath which there may possibly be buried a deposit of ashes, etc. A sculptured intaglio impression of a natural size hand was also removed from a rock near the pueblo.<sup>2</sup>

In agreement with Bandelier's general conclusions regarding most of the southern Galisteo pueblos, Colorado may safely be put down as prehistoric. If Indians inhabited the site at any later time, as is barely possible, it was only temporary. The settlement, like San Cristobal, gives some evidence of having grown from small beginnings, and while the duration of its occupation cannot have been as long as that of San Cristobal, it was certainly longer than that of Largo. Whether Colorado was abandoned before or after Largo is difficult to say, but the probabilities seem to favor Colorado as the first of the two to be vacated.

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<sup>1</sup> Among the pottery fragments found in building IV there were two (found in separate rooms) which were clearly of foreign make. The body of the vessel represented was of a lemon color and the ornamentation consisted of dark brown lines and dots. It resembled Hopi ware more than anything else.

<sup>2</sup> It might be added that there are a number of interesting pictographs in the vicinity of the pueblo, some on boulders at the base of the talus slope and others on what appear to be inaccessible points on the vertical cliff. For example, there are some bird figures at the top of the cliff near the head of the next canyon below the spring, and there is a large human figure, visible at times, on a very high smooth stretch of the cliff to the north of the pueblo. A half size European figure (priest?) has been cut on a boulder within 800 feet of the northwest corner of the ruin. Some of the figures may not be of Indian origin, but this cannot be true of all.

## PUEBLO SHÉ.

The ruins of Pueblo Shé<sup>1</sup> are located in the Galisteo basin proper, about five miles southeast of Galisteo. They lie close to the left bank of the Arroyo Jara, i. e., the identical stream which passes Pueblo Colorado, and the two villages are barely three miles apart. Passage from one to the other is nevertheless impossible except on foot or horseback, owing to the intervening canyon. The site, in common with Largo and Colorado, has been mentioned by Bandelier in his Final Report, but it appears never to have been visited by anyone particularly interested in archaeology.

## SITUATION.

The immediate environs of Pueblo Shé are singularly bleak and uninviting. Approach from whatever angle the visitor may choose, he will come upon the site unexpectedly, as it lies in the practically open and barren landscape. But a short stay at the place brings out a number of real advantages which the situation affords and advantages which would hardly be observed in passing. In the first place, while the settlement seems to lie on the flat floor of the small valley, down which comes the Arroyo Jara in a northerly direction before turning westward through the rolling basin country, it is really set into a sheltering hollow of these same basin hills. The shelter is not very noticeable to the eye except on the south, but the actual effect is that the site does not get the full force of any wind unless it blows directly from the north. In the second place, there is a spring within the limits of the pueblo (Plan IV) and there is another spring about half a mile to the east, at the head of a small gully leading out of the foothills to the main arroyo. Moreover, there is usually water in this principal arroyo, alkaline to be sure, but useful; and level land, suitable no doubt for agricultural purposes, is plentiful on both sides of the stream. Building stone was to be had close by at small outcrops and talus slopes off both the southwest and northwest corners of the village and also farther away to the southeast along the edge of the valley. Some wood for fuel could have been gathered on the hills to the south though all building timber must have been brought from a distance. Nor was the general openness of the surround-

<sup>1</sup> Pronounced "Shay" and sometimes spelled "Che." The place is the fourth and last of the sites on the Pankey Ranch to be described in this report.







ings without compensating value for it made the task of guarding against surprises very easy. The indications are, in fact, that a lookout was kept at an advantageous point precisely as at San Cristobal, because there are some remains of a round structure on top of the hill to the southwest close to the edge of the escarpment overlooking not only the village and its immediate surroundings but a large portion of the whole Galisteo basin. The most dangerous avenue of approach, viz., the canyon leading down from Pueblo Colorado, could not be observed from here, however, but would have to be watched from another position on the easternmost edge of the same hill.

#### GENERAL DESCRIPTION.

*Communal Buildings.* The main part of Pueblo Shé covers an area measuring about 900 by 1300 feet. The ruins as plotted (Plan IV) indicate fourteen or possibly sixteen separate dwelling houses, oriented, roughly speaking, with the cardinal points and so disposed as to enclose eight or ten courts. These courts are generally connected by gateways, and similar passages also lead from the courts to the exterior. Some of the buildings are very small and others are large, consisting of two to four wings. The total capacity of the pueblo is estimated at 1543 ground floor rooms, a figure which must as usual be increased by something like one-half to get a correct idea of the housing facilities. But it need not be concluded necessarily that all the ruined structures were inhabited at once. Building XI, e. g., has been partly dismantled and the uncertain group of ruins designated XIV is weathered to a point beyond recognition, though upon being dug into the walls are found to stand fully four feet in height. The cactus bushes are also absent on the northern ruins, while at the same time annoyingly plentiful on all the larger buildings to the south. In short, without actual data to prove the point, one gets the impression that the northern extremity of the pueblo is older than the southern.<sup>1</sup>

*Kivas.* There appears to have been three and only three semi-subterranean kivas at the pueblo. One of these (A) is in the court enclosed by buildings V and IX and is so weathered away that there is nothing to be seen but a slight circular hollow in the ground with a few stones lying around

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<sup>1</sup> The ruins of a typical Mexican house with traces of the familiar round oven are to be noticed at the northern extremity of the pueblo. There are also the remains of a long stone fence running east past the Mexican ruin for about 600 feet, thence south for about 1500 feet and finally west about 350 feet to the escarpment southeast of the pueblo. Another Mexican house ruin is located on the east close to the arroyo and still another to the east of the arroyo a little south of the Iron Spring.



in places on the perimeter. The diameter of this chamber must have been close to 45 feet. Kivas B and C are the source of some speculation. They are situated on the northeastern extremity of the pueblo and so close together as to appear united. Circular mounds of debris, 2 to 4 feet high, with here and there a stone rising from the original walls, mark the place. The debris itself consists of curiously small angular bits of rock, as if fire-cracked; while the buried walls within — as was ascertained by excavation — are built of fair-sized slabs. The chambers must have had diameters approaching 45 feet and were both entered from the east.

*Watch Tower.* This circular ruin, marked D, is also a puzzling affair. It is situated on the best elevated view-point within hailing distance of the pueblo and on a bare rock foundation. The surface of the hill therefore constituted the floor of the chamber, and yet there seems not to be enough of debris to raise a wall of man's height above it. This same debris is made up mostly of large prismatic blocks of stone, which if laid into the wall with normal care could never have fallen down as they have except through human agencies. The enclosed chamber was about 23 feet in diameter and it may have had a doorway on the east side, although that suggestion is not clearly evident. As there was nothing but stone blocks in sight no attempt was made to clear the place in the effort to find a clue to its function. It may of course have been a shrine, though common sense argues more strongly for its service as a lookout place, or watch tower.

*Refuse Heaps.* Five or six mounds of ashes and other rejectage occur on the outside limits of the supposedly most recent part of the pueblo, though they are not so immense as the groundplan may seem to suggest. Only the largest of them, viz., D, was dug into, a trench fully 50 feet long and 4 feet wide being run across the highest part of it. The depth of the material was about 4 feet and it contained both artifacts and burials as well as animal bones and potsherds.

*Springs and Reservoirs.* The pueblo spring has already been referred to and its location has been indicated on the groundplan. On arriving at the ruins no spring was in sight anywhere; but its presence being generally known to the workmen by hearsay, all suspicious looking places were dug into and the right spot located. It was choked with debris and the brackish water in it did not rise to the ground surface. Hence it would seem to have been an easy matter for the Indians of former days to have hidden this source of water supply. The spring was not properly tested and there is some doubt about the quality of the water. The other spring (outside the mapped limits), across the arroyo in the edge of the foothills, is not very strong but nevertheless permanent and at the same time charged with iron. It is known as the Iron Spring and its medicinal virtues are generally believed

in. The waters trickle out at the base of a small east-facing escarpment and are soon swallowed up in the bed of a deep, dry gully cut through this ledge and leading across the narrow flat to the main arroyo.

A few rods to the north of the iron spring there are traces of an ancient dam which must originally have been about 160 feet long and fully 20 feet high at one point near its middle. The reservoir above it was not large, however, owing to the tilt of the hill slope. But the topography which suggested and made possible a reservoir in this place is rather difficult to describe. Perhaps the essential point may be conveyed by the statement that the dam was placed at right angles to the face of a low vertical escarpment. The pressure of the water tore out the high central part of the dam long ago, but both extremes, one at the top of the escarpment and one at some distance away from the base, are both distinctly visible. The second reservoir — also outside the mapped limits — is located about 1200 feet to the west of the pueblo and is made by spanning a shallow ravine with a dam over 300 feet in length. This dam is also partly washed out but it still rises about 4 feet in height and measures 30 to 40 feet through the base. Water is caught in some small holes above the dam and this supply was utilized for the camp during excavations at the pueblo.

#### EXCAVATIONS.

The work accomplished at Pueblo Shé was not all that could be desired. A heavy snow had fallen in the mountains on October 10 and a cold snap followed. The end of the field season seemed at hand. Nevertheless, one to five rooms were excavated in each building and, as that answered the most important question about the pueblo, the work was called off. No one building having been entirely cleared, there is little occasion to write at length about the particular facts discovered, especially as these conform in all essentials to the previously repeated statements. The buildings, with two or three exceptions, were of stone, though not of large, thin slabs, but rather of small thick, angular pieces. Hence, generally speaking, the standing walls were not in the same uniformly sound condition as those of Largo and Colorado. Buildings X, XII, and XIII were of adobe, the walls being in some places constructed of cubical blocks and in another place built of a thick adobe coil, somewhat after the manner of making pottery. The walls rose from 2 to 6 feet in height and were in many instances in good condition. Some plaster remained as a rule, and traces of whitewash were noted in nearly every building. In room 3, building II, this had a pinkish hue. No fireplaces were found, although the walls were occasionally blackened.

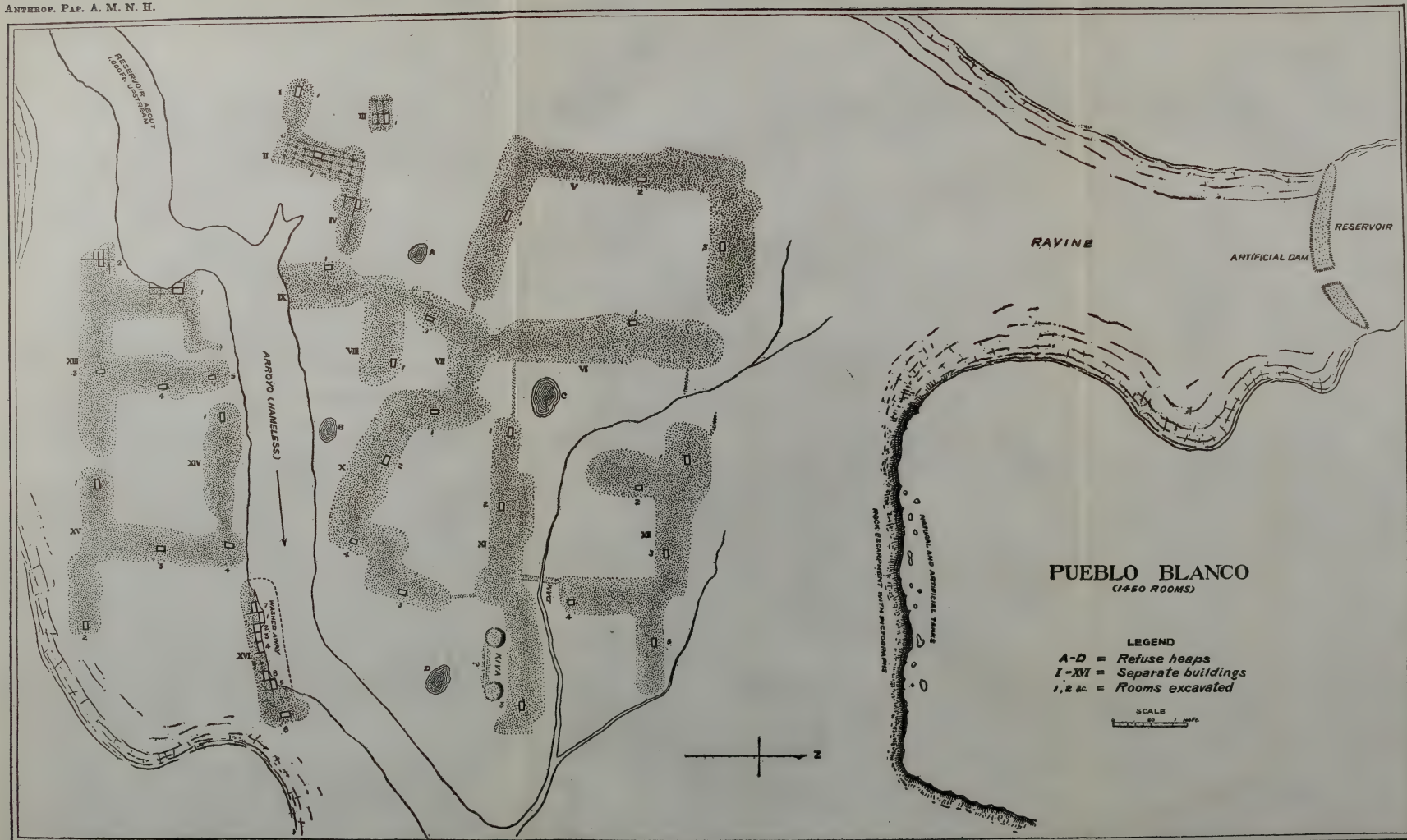
Only two doorways were made sure of, and these were in room 1, building IV, and room 2, building IX. They measured 1 foot, 3 inches by 2 feet, 3 inches and 1 foot 3 inches by 2 feet 8 inches respectively. The floors were of solid adobe and nearly always quite level. Comparatively speaking, the rooms were of about normal size, if anything, a little larger than the general average.

#### RESULTS AND CONCLUSIONS.

Summarily stated, 28 rooms were excavated at Pueblo Shé and the results were 134 complete and 163 incomplete artifacts. The former figure included two small, insignificant pottery vessels. In addition there were listed 11 skeletal finds and normal average quantities of animal bones as well as potsherds of all kinds, corrugated, painted, and glazed. A small lump of coal was found in room 1, building II.

In view of the absence of osseous remains of domestic animals, as well as the absence of the greenish glazed pottery such as characterizes the historic sections of San Cristobal, San Lazaro, and Galisteo, it is safe to affirm that Pueblo Shé is of prehistoric date. It seems also safe to say that it was at no time inhabited to its full extent. At what date Shé was founded and when abandoned is impossible to state, but the indications are that the place was inhabited for a somewhat longer period than Colorado and that it was abandoned possibly before Colorado. These are suggestions, however, based entirely upon superficial evidence and may well be disproved by further investigation.







## PUEBLO BLANCO.

Another pueblo in this partially excavated series is located nearly six miles from Shé, over beyond the southwestern border of the Galisteo basin. The ruin in question can be found without difficulty, being situated close to the north base of the locally prominent volcanic dyke and only a short distance beyond the point where this upheaval enters the western foothills. To some this site is known as Pueblo Largo, to others as Pueblo Blanco, the latter name attaching probably on account of some whitish sandstone escarpments that form a sort of gateway to the valley in which the ruins lie. Bandelier passed here in 1882 (perhaps also at an earlier date) and he alone has left us a brief general description of the place, which he called Largo.<sup>1</sup> The term Largo has been replaced in this paper by Blanco.

## SITUATION.

As suggested, the ruins of Pueblo Blanco are not situated out in the Galisteo basin proper, but a short distance up a narrow valley immediately below the point where the volcanic dyke referred to crosses that depression. A small arroyo breaks through this dyke about 150 yards off the southwestern corner of the pueblo and comes meandering down through the ruins, having already carried away a part of two or three different buildings. No one can view the situation critically without perceiving that it was deliberately chosen, in spite of certain defects that it possesses. For one thing the valley is considerably expanded at this point and the ground though not level is quite smooth. Again, the place is hemmed in by wooded knolls and ridges on all but the east side, and in that direction one looks for miles out through the mouth of the valley, across the Galisteo basin to the white cliffs rising above Pueblo Colorado, and beyond. Consequently Blanco is well sheltered. There is also building stone and small timber in the vicinity

<sup>1</sup> Bandelier's description, barring his observation on the nature of the building walls and also on the number of kivas present, is generally correct and suggests again that there has been but little change during the thirty years' interval. The circumstances leading to the change of name have already been dealt with in connection with Largo. Had Bandelier been accompanied to the site by some Indian and thus identified it as Largo that name might with some reason have been left; but as there seems to have been both a Largo and a Blanco among the Galisteo pueblos there is no choice but to call this place Blanco. If it is Blanco, and if Bandelier's Spanish and Indian names for these various pueblos are properly matched, then the Tano name for the settlement is Ka-ye Pu (See Final Report, II, p. 106).



and agricultural lands are present both up the valley and out in the basin below. But that practically exhausts the visible advantages.<sup>1</sup> Water is particularly scarce. There is, to be sure, a small "dripping" spring about three-quarters of a mile up the canyon to the southwest; still this natural supply, even if used at all, had to be supplemented by artificial conservation as we shall see presently. The natural strength of the position is likewise not so apparent as to elicit special comment. However, watch could and must no doubt have been kept from various high points in order to give notice of the approach of friend and foe.

#### GENERAL DESCRIPTION.

*Communal Buildings.* Bandelier has described the ruins under consideration as those of a large village, forming several quadrangles and capable of accommodating about 1500 people.<sup>2</sup> He goes on to modify the latter part of this statement, however, by saying that the ruins on the south bank of the arroyo "show more and apparently longer decay" than those on the north bank, and that therefore it is not safe to assume a full capacity population for the settlement. This latter observation may well be true, though there are no superficial indications to suggest it at the present time. The ruins, as outlined on Plan V (q. v.), seem to separate into about 15 or 16 distinct buildings, some of which contain only 6 rooms or less while others are very much larger, being made up of a series of joined sections or wings. Roughly speaking, the building wings are oriented in conformity with the cardinal directions and are arranged at right angles in such a way as to completely enclose 6 courts or plazas. To these might be added an equal number of courts that are enclosed on all but one of their four sides. The pueblo as a whole seems small in comparison with some of the others in the region, but on the other hand it is of necessity compactly arranged, and actual calculation shows it to contain approximately 1450 ground floor rooms. Adding one-half of this number for upper story quarters, we have a pueblo with a capacity of over 2000 rooms, certainly more than enough to accommodate 1500 people.

The general appearance of the ruins calls for a word of comment. In the case of all the preceding pueblos there have been some building ruins which appeared young and others which were either dismantled or in a relatively

<sup>1</sup> A seam of coal now being mined crops out only a few hundred yards to the west and northwest of the ruins, but there is no evidence at hand to show that the Pueblos ever used it as fuel.

<sup>2</sup> Op. cit., p. 106.





PUEBLO BLANCO

General view of building XVI at Pueblo Blanco. This structure stands nearly parallel to the creek bank and has been about half undermined and carried away by the occasional torrent.

(Page 87)



advanced stage of decay and obliteration due to weathering. If we except buildings II-IV, which may possibly have been slightly dismantled, the majority of the ruins at Blanco are about equally weathered, and this weathering appears to have reached a relatively advanced stage. That is to say, while the buildings of this pueblo, like those of the preceding, were constructed largely of stone and must, when first collapsed, have presented rough and uneven surfaces, full of holes and crevices, the tops of the ruins are today approaching a smooth condition and the debris is firmly packed. The holes and crevices have all been closed as the result of time and the workings of natural agencies. This has made it difficult for cactus seeds to find lodgment and thus obtain a start; and, if appearances are not entirely deceptive, the old crop is on the point of dying out. The prediction seems therefore not unwarrantable that in a few decades the visiting archaeologist will find the ruin as free from this pest as the valley floor itself. But can this weathering process and the consequent condition of the cactus growths after all furnish a sure key to the relative ages of the various ruins? Perhaps not. An element of uncertainty is introduced into the problem by the fact that the pueblos in question were not built of precisely the same materials. The better the nature of the building stone at hand the less adobe was employed in the masonry construction and, vice versa, when the building stone was scarce or of poor quality much adobe was used. This fact alone would alter the resisting power of any given ruin very considerably. Nevertheless, if care is exercised with respect to the above variations in constructive material, there can be no doubt that the examination of the superficial conditions of a pueblo ruin is of some value in the effort to determine its age.

There is still another possible clue to the age of Pueblo Blanco. On the occasion of Bandelier's visit in 1882 the creek had already partially undermined the ruins on the south bank. But the author does not state how many or which buildings were so affected or to what extent they were removed. Perhaps there has been no appreciable change. In any case the rate of removal is probably a variable one, making a thirty year observation far too short a period on which to base a sound estimate of the age of the buildings affected. To date fully one-half of building XVI has been carried away (see Plan V and also Plate 3), but who shall say whether that is the work of three or four decades or three or four centuries? Still, in the course of time, it seems plausible that the phenomenon might prove useful for chronological purposes.

*Kivas.* According to Bandelier "at least five estufas can be detected within the squares of the large courtyards formed by the edifices."<sup>1</sup> This

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<sup>1</sup> *Op. cit.*, p. 107.

is a rather extraordinary statement in view of the fact that only two kivas can be found today and these are not strictly within any of the courts but are located on the plot of ground separating building XI and the main arroyo. These kivas were subterranean and had diameters approaching 30 feet. They were close to building XI and barely 40 feet apart. Two parallel lines of stone and debris seem to mark a passage which may have connected the two chambers. There is also a slight hollow within the same enclosure over near building X, and still another within the court surrounded by buildings X and XI, but neither of these can be the remains of kivas. Of the "very peculiar arrangement of ten stones, in three parallel lines . . . set in the ground . . . at regular intervals," observed by Bandelier, nothing now remains.

*Refuse Heaps.* It is a remarkable fact that there are no refuse or burial mounds at Pueblo Blanco. The three or four visible traces indicated on the groundplan are negligible, at least so far as amounts of debris are concerned. The accumulation marked C is the largest, but while this was not dug into it seems too small for general burial purposes. One may suppose, of course, that the ashes and other waste products of the village were thrown into the arroyo and thus carried off by the flood currents. But it should be borne in mind that the refuse heap is a recognizable feature of a large number of the pueblo ruins in the Southwest and that it seems to have served everywhere as a repository for the dead. Therefore the most obvious inference to be drawn from the absence of burial mounds at Pueblo Blanco is that the settlement was not inhabited long enough to permit the accumulation of debris, such as is seen, e. g., at Shé and San Cristobal. There is, however, the possibility that some refuse may lie buried underneath the ruins, and evidence of such a deposit was actually discovered in room 5 of building XII.

*Reservoirs.* Traces may be noted on the groundplan of a number of walls that closed several of the passages leading from one court to another. One of these walls, viz., that connecting buildings XI and XII, is of particular interest because it seems to have been strengthened to the point where it served as a dam, thus making an actual reservoir out of the enclosed court. The water supply thus created could not have amounted to much, however, because if allowed to rise above three or four feet the water would have damaged the surrounding buildings. Moreover, a good share of the available watershed was cut off by another dam about 750 feet to the north of the pueblo. This dam was thrown across a shallow ravine at a narrow point and produced a considerable reservoir. It is now dry because the retaining dam, which is fully 200 feet long and seemingly close to 10 feet high, is broken. A third reservoir was located about 400 yards west of the pueblo,

in a shallow ravine which drains into the main arroyo directly above the dyke. The dam here is also broken and pretty nearly washed out, but some idea of its extent and construction may be obtained from Fig. 11. As will be observed, some stones, originally set on end, were embodied, but the bulk of the material was necessarily adobe. Precise data on dimensions are not available, but the length of the curving dam was fully 300 feet.



Fig. 11. Partial View of Reservoir Dam near Pueblo Blanco. The Dam has been completely washed out in the Foreground and is Low all over but extends almost to the Extreme Left of the View.

Mention may also be made of a few so-called tanks found hollowed out in the surface of the sandstone above the escarpment to the north of the pueblo. These small cavities, which really furnish a welcome supply of water at times, are probably the results of chemical solution, though some may possibly have been artificially enlarged as was done in one case at San Lazaro.



## EXCAVATIONS.

*General Observations.* The advance of the season compelled expeditious work at Blanco and consequently the separate buildings were merely tried out. Only 47 rooms were excavated but the results obtained were so uniformly consistent and so like those found at other ruins in the vicinity as to entirely satisfy the scope of the investigations. Under these circumstances elaborate description of details may be dispensed with as before where no buildings were entirely cleared. The rooms dug out ranged from 5 feet 9 inches to 8 feet 8 inches in width and from 7 feet 5 inches to 19 feet 1 inch in length. The last figure, relating to room 1, building I, seems extraordinary, and were it not that several other rooms are over 12 feet in length it might well be thought that a cross partition had fallen, thus adding two rooms together. The standing height of the walls varied from 2 feet 9 inches to 6 feet 6 inches, and their thickness, as Bandelier says, is commonly less than 12 inches. They are generally built of stone, though in a few cases of adobe, and are almost uniformly in excellent condition. Plaster remained attached, at least near the base, and this in many of the rooms was either blackened or showed traces of whitewash. The floors were usually of adobe and often blackened; but in some rooms the smooth rock surface of the gentle slope upon which part of the pueblo stands seems to have served the purpose. Open fireplaces were found only in room 1, building IV, and in room 3, building XIII. As usual they were set into the floor and against one of the side walls, their measurements being 15 by 19 inches and 12 by 16 inches respectively. No less than 22 doorways were found in the scattered rooms. These with one exception were set into side walls and never into end walls even though, as sometimes happened, there were two entrances to the same room. So far as could be judged, nearly all the places dug out were inside rooms, so that nothing can be said about the presence or absence of doors in the outside walls of any of the buildings. The width of these doors ranged from 13 to 23 inches and the height from 15 to 42 inches. There were five additional apertures too small to have served as doors, inasmuch as their dimensions were less than 12 inches. The smallest of these measured 4.5 by 5.75 inches. Another one, measuring 6.5 by 10.5 inches, was divided into two equal parts by a stone slab set vertically. Small niches were noted in the walls of three different rooms. They were either roundish or angular in outline, measuring from 6 to 13 inches across and 9 inches in depth, and presumably served as shelves or receptacles for special objects.

*Inter-mural Shrine.* By far the most interesting discovery of the season

was made in room 3 of building X. Here, on a small earthen platform and leaning against the east wall, stood a carved stone image surrounded by numerous objects, natural and artificial. (Fig. 12.) The platform or altar, as we may properly call it, measured approximately 17 by 25 inches heri-



Fig. 12. View illustrating a Shrine found in Room 3, Building X, Pueblo Largo. The Stone Idol and the Objects lying around it rest on a Small Earthen Platform or Altar.

izontally and 4 to 6 inches in height. It was placed about midway in the room but over against the east wall and, curiously enough, covered up a fireplace of somewhat smaller dimensions. The fireplace itself was set into

the floor in the usual way, framed on the sides and bottom with stone slabs, and filled with ashes. As may be observed in the illustration, the altar platform was practically covered with specimens — offerings perhaps — some of which were broken by the workman's pick. The collection comprises 32 objects, including several miniature pottery vessels, two pointed bone implements, some chipped points of flint and obsidian, a smoothened angular boulder, a thin, circular disk of shale (broken), an oblong, pecked and rubbed specimen of white quartz, a few small pebbles with worked or polished facets, a small cupped anvil or hammerstone, a small boulder of iron ore, two oblong nodular concretions, a fossil fragment, some fragments of petrified wood and a cup-like fragment of some calcareous deposit. The precise arrangement of these various objects is not vouched for, because nothing unusual was suspected until the idol itself came into view. The latter alone was photographed in place, exactly as uncovered. Very little can be added in the way of description to the illustration of the image. It is made of some fine-grained variety of sandstone. The specimen is 21 inches long and measures 3 by 3.5 inches on the bottom, but tapers slightly upwards, with a longitudinal curve. The back side is hollowed out somewhat, but smoothened, and the front side of the body portion shows three ground facets. Only the face of the image is brought out, and this is done by rubbing away all but the main features, such as the eyes, nose and mouth, which stand out in relief. This facial portion of the specimen is covered by a coat of dark red paint and the body portion bears evident traces of having been coated with green. Mixed with these colors was some substance, perhaps powdered mica, which has lent a strikingly glistening hue to the figure.<sup>1</sup>

A few facts may be added about the room itself in which the shrine was found. The average dimensions of the chamber were about 8.5 by 9.5 feet. Its walls, largely of adobe, were in good condition and stood to a height of over 6.5 feet in one corner. Plaster remained over all and a partly blackened coat of whitewash is visible even in the illustration. There were traces of rotted ceiling beams in the east wall, 4.5 feet above the adobe floor. In this same wall, respectively 6 and 18 inches from the south wall and 12 and 14 inches above the floor, there were two small loopholes. These apertures were 4.5 inches apart and were roughly rectangular in outline, the one nearest the south wall being 7 inches wide and 6.5 inches high, the other 5.75 inches wide and 4.5 inches high. Both were filled with stones that must have been placed in them by hand. In the south wall, 2 feet above the floor, there was an unframed doorway measuring 14.5 by 17-18

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<sup>1</sup> The specimen is catalogued as No. 29.0-2755.



inches; and in the west wall, about 6 inches above the floor, there was another doorway with dimensions approaching 13 by 17 inches. Both had been walled up.

For the present at least the writer cannot attempt to discuss the nature and function of this discovery. Whatever may be the truth about the stone idols in the museum at Santa Fe, and perhaps elsewhere, this is a genuine prehistoric specimen,<sup>1</sup> and its occurrence is not surprising in view of Espejo's statements about idols and chapels in the Rio Grande country.<sup>2</sup> The nature and composition of the group thus placed on what, for lack of a better term, we may call an altar, settles any question there may be about the native origin of this feature of ceremonial life. European influence can safely be discounted.

#### RESULTS AND CONCLUSIONS.

The investigations at Blanco were limited to the survey of the pueblo and the excavation of 47 mostly scattered rooms. A number of pictographs found on the rocks in the vicinity were also either traced or photographed.<sup>3</sup>

Aside from the unusual collection found in the shrine chamber, the artifacts ran about as usual and varied in no essential particulars from those found in any of the other prehistoric ruins. The record is not quite finished, but it indicates the recovery of 308 complete and 155 incomplete specimens. Among these are 8 small pottery vessels, an imitation conch shell carved out of some soft, whitish rock substance, and a semi-realistic animal figure — perhaps a squirrel — also carved out of soft rock. Animal bones seemed relatively scarce but broken pottery, representing incomplete vessels, occurred in normal quantities. Only three incomplete human skeletons were recovered from rooms in buildings XI, XII, and XVI respectively.

In conclusion, it may be stated that Pueblo Blanco was undoubtedly in ruins at least before the Spaniards began to colonize New Mexico in 1598, and probably even before the arrival of Coronado in 1540. Bandelier's question as to whether or not this settlement may have been one of the five

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<sup>1</sup> Another somewhat similar but more complete image was found in a prehistoric building at Pueblo San Lazaro.

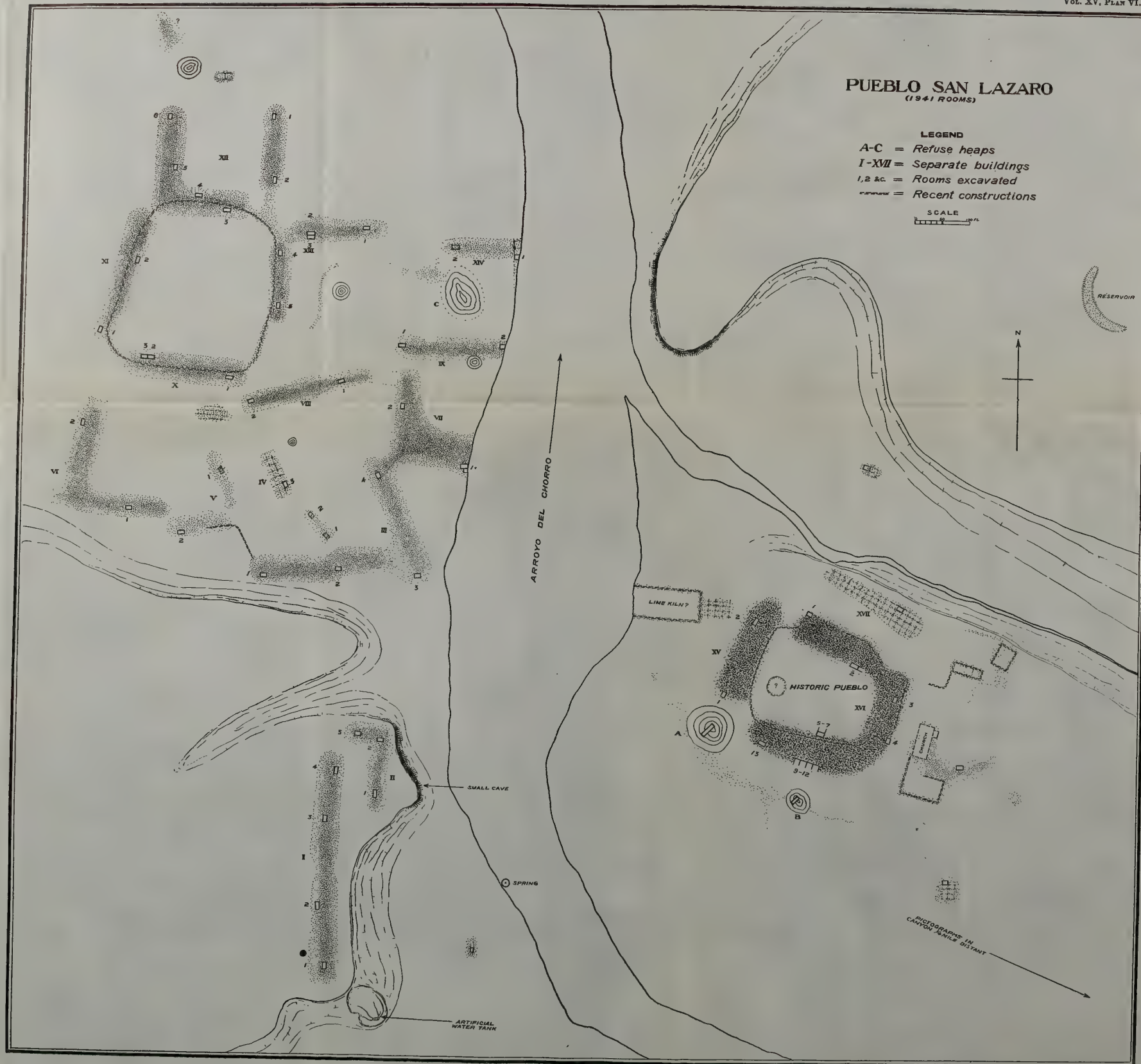
<sup>2</sup> Hakluyt Voyages, III, 393; see also quotations by Prince, op. cit., p. 42.

<sup>3</sup> These rock inscriptions occur on the sandstone escarpment to the northeast and also on the trap rock along the top of the dyke for some distance to the east. Possibly they are to be found all along the dyke, as quite a number are to be seen from the N. M. Central railway where it passes through a natural gateway. Some of the figures are of the geometric order but the majority seem to represent forms of life, such as birds and various local mammals. Several, among them the bear, fox and squirrel, are about natural size and very lifelike. Another striking example is a huge horned serpent over 25 feet long.

historic Tano mission pueblos is therefore answered.<sup>1</sup> Not a single scrap of evidence suggesting European contact was brought to light by the excavation. Further than that it is unsafe to dogmatize. In all probability Blanco, like the other settlements, grew from a small beginning, but, relatively speaking, the period of its occupancy must have been short. At what date it was abandoned is impossible to say. It may have been simultaneous with Pueblo Shé. If not, it was earlier.

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<sup>1</sup> See Final Report, II, p. 107.







## PUEBLO SAN LAZARO.

The two ruins that remain to be considered in this paper are of the same historic date as San Cristobal, but like the latter they were inhabited long prior to the arrival of the European missionaries, who gave them their names and who served them during most of the last century of their existence. One of these two ruins is located about five miles north-northwest of Blanco, on the banks of the Arroyo del Chorro, fully two miles above its juncture with Galisteo Creek. The place can be reached by wagon either from Blanco or from any of the nearby railroad stations to the north. A descriptive paragraph by Bandelier in his Final Report shows that he visited the remains, to which he attached the aboriginal name I-pe-re.<sup>1</sup> The Spanish name given to the pueblo early in the 17th century and by which it is still known is San Lazaro.

## SITUATION.

The ruins of San Lazaro are situated on both the east and west banks of the normally dry bed of the Arroyo del Chorro at the point where it emerges from the high-relief country on the south. The channel broadens out here as it enters on the open, flat-bottomed alluvial valley which conducts it to the Galisteo and its banks become accordingly quite low. A small tributary joins the main channel from the southeast and a short distance farther down a larger one comes in from the southwest. Within these three forking

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<sup>1</sup> Op. cit., II, p. 105. This description, strange to say, is incorrect in almost every particular. It also seems as if the author saw only the relatively small historic section of the pueblo on the east bank of the creek and paid no attention to the prehistoric part on the opposite side. San Lazaro has also been mentioned by other writers and the site appears on several of the old maps covering the Pecos-Rio Grande country. See Bul. 30, II, p. 446, Bur. Amer. Ethn.

As to the history of San Lazaro there is very little to be said because nothing is definitely known. In the Historical Introduction it has been pointed out that the settlement was probably in ruins already in 1540, when Coronado passed. At what time the site was reoccupied cannot be stated positively, but it seems not to have happened until after the introduction of the permanent missions at the close of the 16th century. A chapel was built at the pueblo, which, however, is supposed to have remained a visita of the mission at San Marcos, precisely as San Cristobal was served by a priest from the mission at Galisteo. Finally, the date of the abandonment of San Lazaro cannot be fixed, though it must be placed between the years 1680 and 1692. The inhabitants were found by Diego de Vargas in the latter year at their new pueblo of the same name near the present Santa Cruz. From here, after having suffered great reduction in numbers during the period of the Rebellion, they dispersed in 1696.

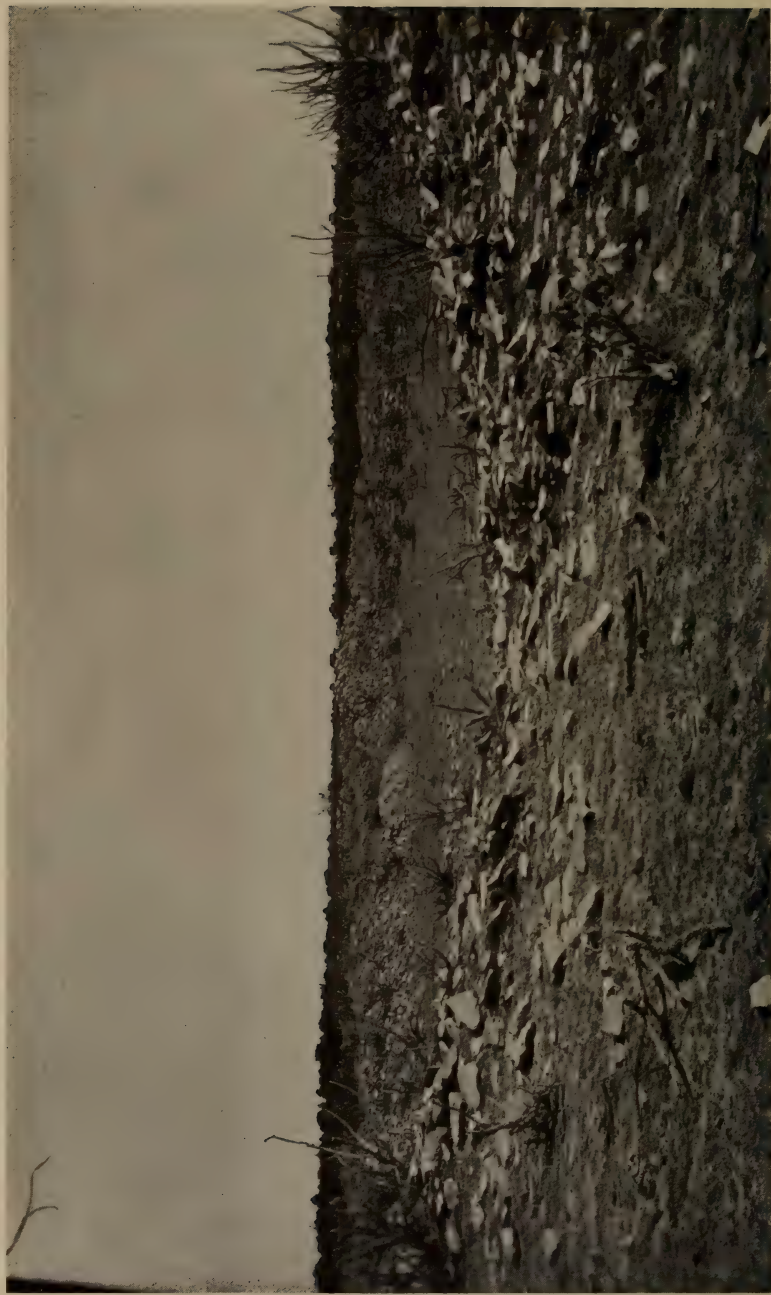
channels lie the ruins, for the most part on low, smooth, though not entirely level ground. The historic pueblo is situated on a broad, gently sloping ridge on the right bank, and the prehistoric pueblo lies directly opposite, partly on the low, smooth valley floor and partly on a bald, rocky eminence which presents a slight escarpment to the creek (Plan VI). A permanent spring of brackish water issues as if from under the left bank of the arroyo directly below this hill and the water continues on the surface for about six or seven hundred feet down stream when it again disappears. Presumably this is the real secret of the location of the pueblo. At any rate the situation affords little in the way of natural defenses, being practically surrounded by generally higher and semi-forested country. The view is open only down the valley to the north, though one may look over the low ridges to behold the bold outlines of the Ortiz and San Pedro Mountains to the west and southwest, the less impressive Cerrillos peaks to the northwest, and in the more distant northeast the bulky domes that mark the southern extremity of the Rocky Mountains. Timber is conveniently near, and building stone, though neither plentiful nor of good quality, is to be had in the vicinity. Small patches of land suitable for agriculture are present both directly above and below the settlement, as well as farther down towards the Galisteo. On the whole, therefore, it is a well-chosen site.

#### GENERAL DESCRIPTION.

The first thing that strikes the visitor to San Lazaro is the absence of cactus bushes on the ruins west of the creek and the presence of the same on the ruins opposite. Weathering processes appear also to have been at work much longer on the buildings to the west than to the east of the broad, gravelly channel. However, a closer examination tends to modify this judgment somewhat, because on the one hand there are still some half dead growths on buildings I and II, which lie off by themselves on the hilltop to the south; and on the other hand there are some old-looking ruins on the east bank which are as free from cacti as they could well be. Furthermore, although numerous bushes of this thorny parasite exist on the large, fresh-looking ruins constituting the historic pueblo, few of them are in a vigorous condition. But artificial agencies may have been at work here. This ruined settlement, in contrast with all the rest, is incorporated in a small Mexican ranch the buildings and cultivated fields of which lie directly beyond the mapped limits on the north. The site has evidently been much over-run by sheep and cattle and protruding stones have unquestionably been removed from the tumbled debris for the construction of corral fences as well







SAN LAZARO

Partial view of the historic San Lazaro pueblo, looking through the southwestern gateway into the court. This is the most conspicuous of the Gallisteo ruins but gives a fair idea of the general condition in which these remains are found.

as ranch buildings. Consequently, while there is no doubt about the different ages of the east and west side ruins, it is not safe to jump at a conclusion about the relative antiquity of the prehistoric pueblo. It is the writer's personal opinion that San Lazaro is as old as San Cristobal, but that opinion is based upon the nature of the pottery found and not on the superficial appearance of the ruins themselves.

*Historic Ruins.* The historic pueblo is easily made out. It consists of four building wings arranged on the four sides of a rectangular court. Three of the four wings are united into one building, the remaining one being set off by itself so as to afford entrances to the court (Plate 4). These ruins represent unusually wide and also, it seems, uncommonly high buildings. The latter suggestion may, however, be due in part to the contour of the building spot and the possible removal of soil or adobe from the interior court. Within the court, close to the southwestern gateway, there is a small hole in which rain water collects and which may possibly have been a kiva.<sup>1</sup> The two gateways leading to the court appear to have been closed by walls, as Bandelier points out; but it is perfectly evident that these walls are not of aboriginal origin because they can be followed up onto and clear around the entire ruin. Some sheep owner has simply taken advantage of the shelter afforded in this court and from the protruding stones conveniently at hand he has constructed a low wall serving to keep his flock together. This may have happened many decades ago, for the wall is mostly fallen and in places quite obliterated, as is the case also with a Mexican house and a smaller corral situated close by on the northeast.

*Chapel.* Behind the pueblo, i. e., to the east or southeast, are the remains of the church or chapel, also a small accessory building and a corral or possibly a churchyard. The pile representing the chapel is not very impressive because all the debris and masonry have been removed to the ground level with the exception of the eastern wall, which still stands 3 to 4 feet in height. Evidently the structure was a simple rectangular affair, measuring 28.5 by 64 feet on the inside. The walls had a thickness ranging from a few inches below to a few inches above 3 feet. Somehow, the place does not seem to have been lined up with the pole star, but rather with the adjacent pueblo. What end the door was in cannot be determined. From the nature of the ground outside, the north end would have been most suitable for the entrance, but if the fenced tract on the south was a churchyard and not a corral, doubtless the door to the church was here. A couple of rooms were cleared in the adjoining building, and of these the one near

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<sup>1</sup> Bandelier in the paragraph cited mentions "two circular sunken depressions," but only one is visible at the present time.



the northeast corner of the chapel measured 9.5 by 10 feet, had a solid adobe floor, a door 2 feet 10 inches wide and excellent walls 1 foot 8 inches thick, with a heavy coat of clean whitewash still adhering to the plaster. Judging from the hard, brick-red condition of the plaster in one corner there must have been a fireplace here, probably of the hooded type still to be seen in Mexican dwellings. Nothing whatever was found either here or in the rooms cleared in the east wing of the same building.<sup>1</sup>

*Prehistoric Ruins.* The excavations carried out in the historic pueblo were insufficient to determine beyond all doubt whether or not the buildings in question were constructed in prehistoric times. The impression is that they were not, i. e., it is not a case of rehabilitation here as at San Cristobal but the construction of a new and well planned village. Nevertheless there are some prehistoric ruins east of the arroyo and building XVII is one of these. In addition three or four small unnumbered buildings have been indicated on the groundplan, which, if of Indian origin, are probably also prehistoric. But the real main pueblo of ancient times lies on the west side of the locally very broad stream channel. Buildings I and II are situated on a rather exposed hill, which location nevertheless offered some advantages from a defensive point of view. These ruins are easily distinguished. Between building II and the arroyo, half way up the face of the irregular 30 to 40 foot escarpment, there is a small cave in which burials are said to have been found. The remainder of the pueblo, and that means the larger portion of it, lies on lower ground to the north. Here the numerous buildings are not always readily distinguishable and no doubt some of them, like IV, V, XIV and three or four other minor structures, have been dismantled. Three edifices jut out on the arroyo, and there is every indication that a considerable portion of these and perhaps all of their connecting wings have been undercut and carried away by the occasional torrent. On the whole the various buildings in this division are irregularly arranged as if there were groupings among them belonging to different stages in the life of the village. Thus buildings X to XIII, and possibly VI, may have formed one unit. Four wings of this group enclose a very large court, which in times long past — perhaps during the pueblo's historic period — served as a corral or sheepfold. The proof consists in traces of a wall which has passed along on the tops of the four enclosing ruins and down across the intervening spaces on the corners, exactly as in the case of the historic pueblo. This same court

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<sup>1</sup> Between the arroyo and the northwest corner of the historic ruin there are the remains of what seems to have been a large building. At first this was thought to have been the church, but its dimensions are too large, even discounting the fact that the creek may have carried away the west end. A workman said he had been told of a limekiln erected here, but whatever it may be it is doubtless modern. The enclosure either joins on to or covers up part of an older Indian building, probably of prehistoric date.

has also within the memory of local residents served as a reservoir and the intake ditch is still noticeable, coming across the hill slope and entering the enclosure at the southwest corner. There are no visible kivas or anything else of interest in the court save possibly three or four bushy growths of cedar. But these latter might well have been there during the pueblo's occupation and hence cannot be appealed to for a possible check on the age of the ruins surrounding them.

*Size of Pueblo.* Bandelier regards San Lazaro as having been a smaller pueblo than San Cristobal, but this conclusion is not borne out by a thorough examination. As suggested above, however, he may have seen simply the historic section of San Lazaro and with only that part of the ruin for comparison his judgment is quite correct. Calculations show this part of the pueblo to contain about 488 ground floor rooms as against 650 ground floor rooms at San Cristobal. But at San Cristobal no entirely new or additional pueblo was constructed after the arrival of the Spaniards, as was probably the case at San Lazaro. Hence, if we disregard the chronological divisions at the latter settlement, as was done in estimating the total size of the former we have in San Lazaro a pueblo with a ground floor capacity of about 1941 rooms. In other words, San Lazaro is the largest pueblo ruin thus far examined in the Galisteo region.

*Refuse Heaps.* There are some six or seven deposits of refuse in and about the ruins of this pueblo but none are large. The most conspicuous are A and B, over near the historic ruins, and these are presumably of the same date as the ruins themselves, though this was not made clear by the small trench dug into them. Across the arroyo, at C, there is another accumulation of unknown extent. As a matter of fact, there is no actual mound here, but an irrigating ditch dug through the place shows that ashes and other debris — including potsherds representing old wares — extend to a considerable depth. The material seems to correspond in age with that of the oldest refuse heaps at San Cristobal.

*Reservoirs.* It would seem that the water which rises to the surface in the creek bottom for a short distance adjacent to the pueblo was not regarded as all-sufficient. Perhaps its saline character made it unsuitable for some purposes. At any rate a small reservoir was constructed in a shallow ravine about 250 yards northeast of the historic ruins. The dam, thrown up in the usual way, of adobe and some rocks, is today a low, crescentic mound about 125 feet long and possibly 20 feet through the base. Although of insignificant proportions, the basin thus created still appears to retain for a time the surface flow of the summer rains that come down the hillside depression. In addition to this created water supply there are in the surface of the exposed sandstone of the hill to the south and southwest of the ruins

a number of small eroded cavities in which rain water collects. One of these so-called tanks, located on the lower edge of a large, rather smooth-surfaced rock projecting from the hillside off the southeastern corner of building I, is of interest because it has been artificially enlarged. It takes the form of a rectangular hollow measuring about 4 by 7 feet on the horizontal and nearly 1.5 feet in depth. In the middle of the bottom there is an additional mortar-like basin approximating 1.5 feet in diameter and 1 foot deep. Several small channels have been pecked into the rock surface above and these have been so ingeniously placed as to conduct practically all the rain water that falls on the sloping exposure into the reservoir. Of course the amount of water conserved in these small rock tanks would have been insignificant where a pueblo of a thousand or more people was concerned, but the pure, non-alkaline fluid may have been sufficient for certain special purposes. The Mexican women still find these small supplies very useful for washing clothes.

#### EXCAVATIONS.

In accordance with the general plan of work, which was to a certain extent dictated by circumstances, Pueblo San Lazaro was merely tried out. The test included, however, the excavation of about 60 rooms, scattered as evenly as possible among the 26 or more separate buildings constituting the entire ruin. But inasmuch as no one building was completely cleared it will be of no use to consider them separately at this time and we may as before summarize in a few sentences such general observations as seem of permanent value.

As was suggested by the washed out and generally smooth appearance of most of the prehistoric ruins, they were found to represent buildings constructed largely of adobe. It is not that the various edifices can be separated into those built of stone and those built of adobe, because few structures were found in which the two elements were not mixed, and the mixture was of a curiously promiscuous nature. That is to say, one room in a given building might have walls constructed of stone and another room not far away in the same building might have walls constructed of adobe. Again, opposite walls in the same room were found on occasion to be thus constructed of different materials, and in a few instances the lower portion of the wall was of adobe while the upper part was of stone, or vice versa. Evidently there was a dearth of building stone, and the kind which was at hand was a rather soft and friable sandstone, none too substantial when compared with first-class adobe. The historic pueblo was, however, built



of stone, at least so far as investigated; but its walls, though relatively young, were comparatively unstable, as was the case in the historic ruins at San Cristobal. In height the walls of the prehistoric buildings range from 1 foot 8 inches to 7 feet 6 inches, and in room 1, building VII, they appear to rise fully 8.5 feet. Near the high center of this same building the masonry may stand perhaps over 10 feet, but in all probability we have here the debris not of one but of two or three superposed ruins. The walls in the historic pueblo, so far as determined, range in height from 4 to about 7 feet. In size, referring to the pueblo as a whole, the rooms approach close to the general average for the region, but concerning details on that point the student is referred to the table of measurements. Ten of the rooms had blackened walls and five showed traces of whitewash. Plaster was commonly present, at least on the lower two or three feet of the wall. In some rooms the adobe floor was also blackened. Only five hearths, of the usual sunken rectangular type, were discovered, however, and these ranged from 9 to 15 inches in width and from 10 to 28 inches in length. Small rectangular bins measuring about 2 by 3 feet and constructed of stone slabs were located in two of the rooms and in the walls of two other rooms were found small roughly circular niches 6 to 8 inches in diameter and 4 to 8 inches deep. Only 6 doorways were made out for certain and most of these seemed too small to admit a full-grown person. Their dimensions ranged from 11 by 18 inches to 17 by 24 inches. Fragments of what must have been ceiling timbers were met with occasionally in both divisions of the pueblo, though naturally very seldom in the prehistoric ruins.

#### RESULTS AND CONCLUSIONS.

From the 60 rooms wholly or partially excavated there were obtained 424 complete and 308 incomplete artifacts, in addition to fully 3 bushels of broken pottery and about 2 bushels of animal bones. The latter were of course removed for the most part from the historic ruins and represented domestic animals. Only 8 human skeletal remains were uncovered, one fine specimen coming from beneath the floor of room 3, building I. In the same room were also found two complete food bowls of ancient manufacture. The artifacts vary not one whit from the types mentioned at Colorado and their general run and relative frequency are also about the same as in the other neighboring pueblos, excepting the pottery, which, however, may be a mere coincidence. All told there were 15 complete specimens of pottery found at San Lazaro, including large and small jars, medium-sized bowls and some platters adapted apparently from the bottoms of larger vessels.

The most interesting discovery was another stone image or idol, somewhat like the one found standing on the inter-mural altar at Blanco. The San Lazaro specimen occurred in room 1, building VI. It was found in an upright position, pressed into the plaster of the east wall, near the northeast corner and 4 feet 4 inches above the floor level. The figure is of hard rock, measures about 2.5 by 4.5 by 15 inches, and shows the eyes, nose, mouth, and hands in relief. The head tapers to a point and the specimen shows traces of reddish-brown paint all over, excepting the middle third of the face.<sup>1</sup>

The chief conclusions to be drawn from the investigations at San Lazaro have been anticipated in the course of the general description. First of all the position and size of the historic pueblo have been determined. The probable extent of the prehistoric settlement has also been made out. From the nature of the architecture as well as from the artifacts recovered it is clear that the prehistoric and historic culture stages here represented are contemporaneous with the corresponding stages found in the other ruins of the locality. The age of the settlement, it has been pointed out, seems to correspond closely with that of San Cristobal, but as to the time elapsed since the prehistoric ruin was abandoned nothing definite can be said. If the masonry had been identical in character with that of Blanco, Largo, Shé, and Colorado, and if the site had not been visibly disturbed by modern residents, then it would have been safe to say that the San Lazaro ruins were older than any others in the Galisteo country, excepting perhaps the oldest at San Cristobal. As it is, we shall for the present have to be content with the statement that the abandonment of the prehistoric San Lazaro dates back at least as far as the corresponding event for Largo, which is perhaps the youngest and best preserved ruin in the Galisteo group.

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<sup>1</sup> See Mus. Cat. No. 29.0-2885.

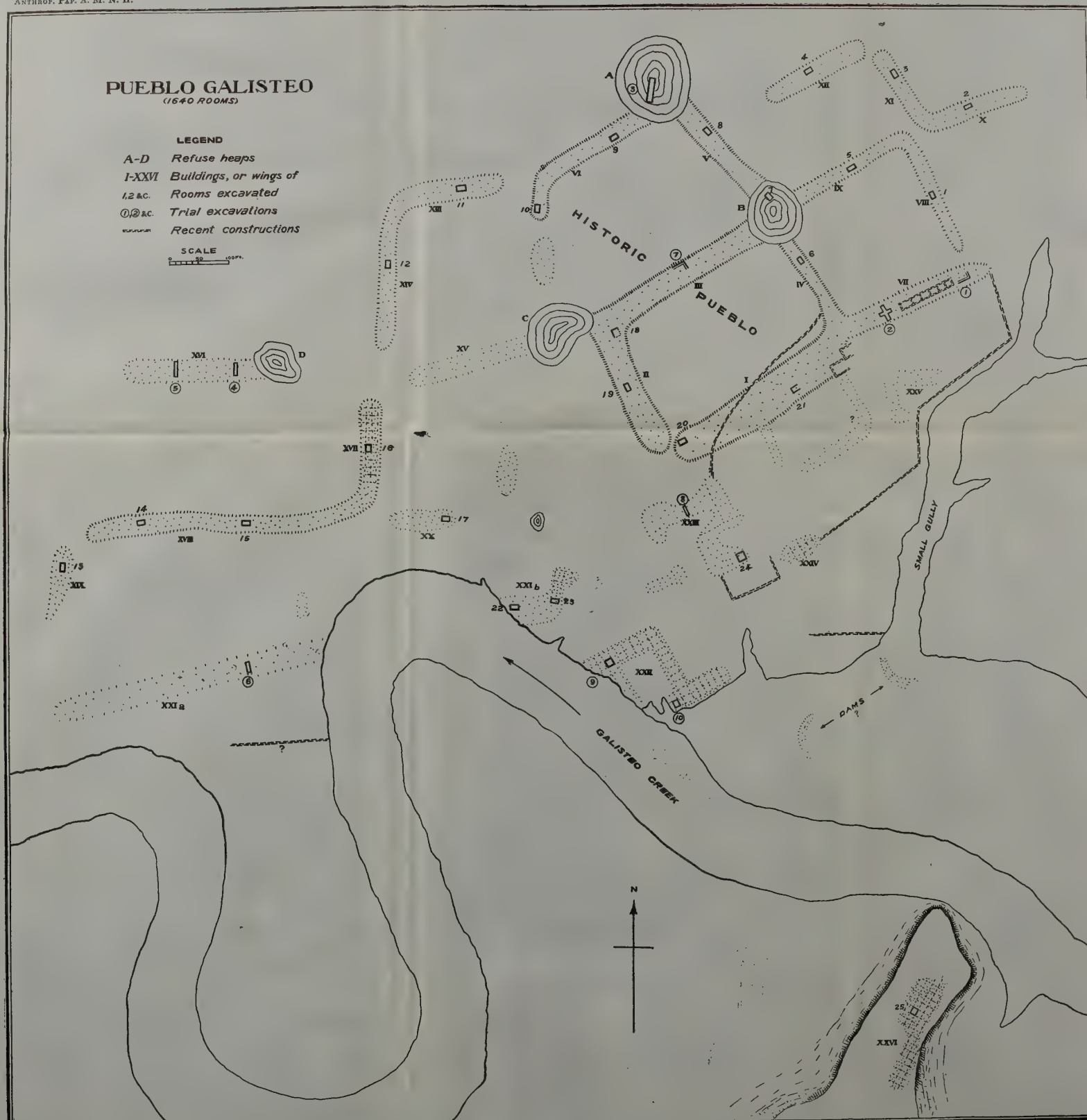
Another stone idol, said to have been found at San Lazaro, is in the possession of Mr. José Ortiz of Galisteo. It is made of a column of sandstone 21 inches long, worked somewhat oval in cross-section, the dimensions of the base being about 5 by 8 inches. A roundish head has been carved out at one end but a stroke of some workman's pick has removed the facial portion. The only other elements brought out are the arms and hands, the right member extending straight down the side while the left is bent so as to bring the hand over the lower part of the chest.

# PUEBLO GALISTEO (1640 ROOMS)

## LEGEND

- A-D Refuse heaps
- I-XXVI Buildings, or wings of
- 1, 2 &c. Rooms excavated
- ①, ② &c. Trial excavations
- Recent constructions

SCALE  
0 20 40 FEET







## PUEBLO GALISTEO.

The last ruin to be excavated to date is Pueblo Galisteo, or as it is called locally, Pueblo de los Tanos.<sup>1</sup> This historic as well as prehistoric settlement is located on the banks of the Arroyo Galisteo, fully one and one-half miles above the present Mexican town of Galisteo. The site is plainly visible from the Santa Fe railroad a couple of miles east of Kennedy station, and can be reached without difficulty at any time of the year. Bandelier was here at some time in the late seventies or early eighties and he has published in his Final Report a partial groundplan and also a few descriptive remarks about the remains.<sup>2</sup>

## SITUATION.

The situation of Pueblo Galisteo is unlike that of any of the other villages, unless it be Shé. The Arroyo Galisteo, after separating from the main stream, takes a northerly course through the modern Mexican hamlet and beyond to a gateway, or "puertocito" in the locally prominent volcanic dyke. After passing this upheaval the arroyo turns sharply to the northeast and for something over a mile hugs the north base of the dyke. Fully one mile above the gateway, at the point where a singular yellow sandstone

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<sup>1</sup> To recapitulate: Pueblo Galisteo has by Bandelier and several other writers been identified with the Pueblo Ximena visited by Coronado in 1540-41. The reason for this identification is not stated and may in any case be doubted. In 1590 Castaño de Sosa appears to have passed the settlement and to have named it San Lucas. When Oñate arrived in 1598 and when the various Indian villages were grouped into mission districts, our particular pueblo was named Santa Ana. But before many years this name was changed to Santa Cruz de Galisteo. According to Bandelier the pueblo was the seat of an important mission and it may have had a church as early as 1617. The mission seems to have grown and prospered up to the time of the Rebellion of 1680, when, if we are to believe Vetancurt, it had a handsome temple. The population at this time has been estimated by Bandelier as close to one thousand souls. Whatever the number, the inhabitants took a prominent part in the Rebellion and it seems that the entire population moved to Santa Fe immediately after the retreat of the Spaniards. Here they remained until killed or sold into servitude by Diego de Vargas in 1693. In 1706, by order of the New Mexican governor, Pueblo Galisteo (or some other place in the vicinity) was settled again by 90 Tanos of uncertain derivation. These increased in numbers for a time but were finally reduced by smallpox epidemics and Comanche depredations to the point where they could no longer maintain themselves, and at some time shortly prior to 1794 took refuge at the pueblo of Santo Domingo. The fact that the ruined site is still known as Pueblo de los Tanos by the Mexican people in the vicinity is circumstantial proof of the relatively recent disappearance of the Tanos from the neighborhood. The new settlement made in 1706 was called Santa Maria de Galisteo, a name which it still retained in 1733. Bandelier determined the aboriginal name of the village to be Ta-ge-uing-ge. See Bul. 30, I, p. 482, *Bur. Amer. Ethn.*, for reference to the place.

<sup>2</sup> *Op. cit.*, pp. 100-103. This author errs in placing the settlement on the banks of the Arroyo de los Angeles.

spur runs out at a steep angle from the said dyke, lies the pueblo. One small ruined building is situated south of the stream channel on top of the high rocky spur itself, but the real pueblo remains lie scattered on the bare level valley floor along the arroyo bank directly opposite (Plan VII). The immediate surroundings are as dreary and barren as could well be imagined. To the north, as well as to the east and west, the valley floor merges gradually into a low, rolling plain and for miles not a tree worth the name is in sight. The view is excellent, however, especially from the rocky eminence to the south of the creek; and if one climbs to the top of the adjoining dyke he may scan the country for many miles in all directions. It is conceivable that an enemy might approach by way of the arroyo, but he could not actually reach the village without exposing himself. Barring a few bushy growths of cedar dotting the north face of the dyke and also relieving here and there the monotony of the extended plain, the nearest small timber is some three or more miles away to the north and northwest, beyond the Santa Fe railway. Water does not rise to the surface in the adjacent arroyo, in late summer at least, but has to be brought from a point about three-fourths of a mile down stream. It is possible, however, to dig down to the flow, and the water, contrary to the usual, is of excellent quality.<sup>1</sup> Extensive tracts of level, tillable land are present up and down the valley, but to be productive some kind of artificial watering must no doubt be resorted to. Some ditches have been noticed on both sides of the arroyo for three miles or more above the pueblo, but these were probably all of modern origin though no one cultivates land in that drainage basin at the present time. It will therefore be seen that, barring the lack of shelter from the northern winds and the scarcity of fuel, the situation possessed some very important advantages. But shelter and a more readily accessible water supply, as well as a somewhat closer proximity to timber, could have been secured farther down stream. Hence, one wonders why the pueblo was placed precisely where it is, unless it was to enable the inhabitants the better to guard their cornfields.

#### GENERAL DESCRIPTION.

Prior to the Museum's excavations the presence of pueblo remains would hardly have been noticed by anyone coming near, unless he had passed directly over the spot. This is because the ruined edifices were constructed

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<sup>1</sup> With a good natural supply of water near at hand there was no occasion for constructing reservoirs, even if there had been any really suitable places in the neighborhood. Nevertheless, there are some suspicious-looking crescentic mounds on a low terrace between the historic pueblo and the arroyo, placed, as it were, across the mouth of a small gully. They may be natural formations, however.



almost exclusively of adobe and are in many cases so washed out and weathered away as to be well-nigh indistinguishable. Careful inspection, however, reveals a number of low ridges relatively free from vegetation and sometimes marked by a few small, angular boulders lying scattered over the surface. There are no cacti here, as in the case of the other pueblos, and there probably never were any. A certain species of weed, sometimes called "snake-weed" by the local inhabitants, thrives to the exclusion of everything else all over the valley floor and its absence generally marks the location of a ruin (Fig. 13). Someone has lived on the site in modern times, the evidence



Fig. 13. View (looking west) of Room 11, Building XIII, Pueblo Galisteo. The Standing Adobe Walls are seen to be scarcely one Foot High and the Bare Level Ground ahead shows the Washed-out Condition of Many of the Ruins.

being the ruins of a long, narrow stone house placed on top of one of the southeastern pueblo buildings. A barn or something has apparently been improvised close to the house on the southwest by digging a cavity into the side of the most prominent of the ruins, and some remains of stone fences which may have surrounded the place are also visible.

*Communal Buildings.* Plan VII is a somewhat unsatisfactory attempt at showing the size, outline, and general condition of the visible architectural remains at Galisteo. Of the 26 actually numbered buildings or building wings only those marked I-VI are at all prominent, and these were

later discovered to constitute the historic pueblo. Buildings VII–XIV are also easily apparent to the trained eye but the remaining structures are very faint, at least so far as surface contour is concerned (Fig. 13). Yet shortly after a heavy rain, owing to the difference in texture of the adobe walls and the debris filling the rooms, the former stand out quite plainly as dark lines on the smoothly washed surface. The rooms outlined in building XVII were thus determined. Elsewhere, as in the case of building XXII, some of the chambers are outlined by a few boulders that probably formed the foundation of the walls. In the case of building XXI there is almost nothing to indicate its presence except a few stones lying about among the weeds. The trial trench (6) dug part way across the marked line encountered no walls whatever, but east of the advancing arroyo bend, which appears to have carried away a large section of the building, the walls of several rooms are visible on the surface. Exposed to view near the top of this same 25–30 foot vertical arroyo bank were counted no less than nine human skeletons. Building XXVI was actually constructed of stone and though presumably very old, being reduced to a practically smooth and level condition, the walls are well marked.<sup>1</sup>

Viewing the groundplan as a whole, one cannot but be impressed with the lack of uniformity in orientation of the different buildings. The faintly marked group to the west is probably of an earlier date than the more unified group to the northeast. But even this group, though perhaps constructed at the same time, has to be differentiated, buildings VII–XII having been abandoned in prehistoric times,<sup>2</sup> while buildings I–VI, as before stated, showed indubitable evidence of historic occupation. The capacity of the historic pueblo has been estimated at 567 ground floor rooms which, if increased by say one-half, would seem to be enough for the accommodation of from 800 to 1000 souls. The strictly prehistoric part of the pueblo contained approximately 1073 ground floor rooms. Combining the figures for the two parts of the pueblo, we obtain a total capacity of 1640 ground floor rooms, almost exactly the estimate reached at San Cristobal.

The quadrangular courts enclosed by buildings I–VI are deep and well marked, but one searches there in vain for indications of the familiar circular and subterranean kivas. What is more remarkable, not a trace of such chambers is to be found outside the limits of the historic pueblo. To be sure, this outer area has been subject to weathering processes for a much longer

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<sup>1</sup> On account of the very strong position of building XXVI one is continually inclined to agree with Bandelier as to the possible identity of Pueblo Galisteo and Pueblo Ximena of Coronado. But this building taken by itself is too small to constitute a pueblo. Moreover, had Castañeda seen Ximena in a unique position like that occupied by this building he would most likely have described it.

<sup>2</sup> There is some doubt on this point in reference to building VII.

period, but had there been any kivas it is more than probable that some evidence of their presence would still remain.

*Church.* The "handsome temple" referred to by Spanish historians and mentioned once or twice in this paper, has not been definitely located. But unless this edifice, contrary to usual practice, was incorporated in one of the large communal houses it must be identified with the obscure and irregular heap of adobe marked XXIII. Some trial diggings were begun here and on one corner a room (No. 24) was opened up and partly excavated. Its dimensions proved to be about 13.5 by 16.5 feet, so that it is certainly not of Indian origin but belongs probably to the convent or church annex. Although the chamber was cleared all along the four walls, leaving only a large column standing in the center, nothing of European origin was found, unless it was the doubtful evidence of a fireplace in the southeast corner. On the other hand, several fragmentary aboriginal artifacts were present. The "temple," whatever its architectural charm, must have been relatively small.

*Refuse Heaps.* Three of the four or five refuse heaps indicated on the groundplan are fairly prominent, though there is some doubt about their real size. The element of doubt arises from the fact that the accumulations are placed, it seems, on top of the ruined buildings, and at the points where two or more wings meet. Possibly there were gateways here leading from one court to another and the rejectage was at first thrown outside the entrance to the inhabited court. In the course of time the buildings nearest the refuse may have been abandoned and gradually as they fell into ruins the accumulating debris covered them up. All that remains to be determined, however; but as these three largest deposits are so very closely associated with the historic pueblo they suggest strongly that this was vacated gradually and not at once. A trial trench was dug in mound A only and this was not carried to the bottom, hence nothing definite can be said at this time about stratigraphic conditions or cultural changes.

#### EXCAVATIONS.

The work accomplished at Galisteo was less thorough than it should have been. But snow was flying and after less than four days it was necessary to call a halt. Almost every one of the building wings was tried out, however, by one or more rooms as conditions seemed to demand. Besides a number of trial trenches, 25 rooms were, with two or three exceptions, entirely cleared. What this amounted to can best be judged by an examination of the table of measurements. The rooms were of normal size, but



while in some buildings, such as I and II, the walls stood from 6 to 6.5 feet in height, in others, as e. g., XIII, they rose but little over 1 foot above the adobe floor, as may be seen in Fig. 13.

The walls themselves, no matter how much or how little of them was left, appeared to be in excellent condition. They ranged from 9 to 15 inches in thickness and were, with a possible exception noted in room 16, of adobe. As nearly as could be made out, these adobe constructions were laid up in successive tiers. That is to say, the walls were not built of cubical blocks, as was noted at one pueblo, nor yet by a coiling process as was observed in another place, but more after the manner of a concrete wall of today. A section of kneaded adobe (with an occasional boulder thrown in) appears to have been reared as one solid mass standing about 2 feet in height. As soon as this was dry and firm enough to support more than its own weight without flattening out, another similar sized section was reared on top of this, and so on. At any rate, whether or not that was the exact process, there are in some cases visible horizontal joints along which the walls break.

Although with but a single exception the walls were made of adobe, they bore evidence of having been plastered with mud. In rooms 4, 12, and 17 the plaster was blackened somewhat, and in 13 and 14 the same was true of the adobe floor. Whitewash was noticeable in rooms 12, 23, and 24, while in room 19 there were traces of a wash or slip of a yellowish-brown color. Not a single fireplace was located, although examples of the upright stones that support the cooking slab were found in the debris of rooms 1, 6, and 8. Presumably they had fallen from the upper story rooms of the house. The walls of room 14 were burned to a brick red color as if from a general conflagration. No doors were discovered and but a single wall-niche or recess was observed. This latter was found in the east wall of room 12, 1 foot above the floor. It was of rounded outline, having a diameter slightly exceeding 5 inches and a depth of 7 inches. Fragments of timber were found in rooms 7, 15, and 25, and in the walls of room 20, exactly 5 feet 2 inches above the floor, there were observed holes for the ceiling beams with rotted wood still present in some of them.

#### RESULTS AND CONCLUSIONS.

The excavations at Galisteo, covering 25 rooms in addition to some trial trenches and several unfinished chambers, yielded 55 complete and 82 incomplete artifacts of the already familiar types. There were found perhaps fully half a bushel of animal bones, most of them coming from the historic section of the pueblo. Potsherds were not very numerous, though

possibly about half a bushel of these was collected. They represent all the different types of ware — simple coiled, painted, and glazed — found in the neighboring ruins; and the peculiarly modern-looking greenish glazed variety, noticed in the historic sections of San Cristobal and San Lazaro, is also present. In addition to the sherds, there were found in rooms 4 and 6 the fragments of two nearly complete sooty black jars of the plain corrugated variety. Only a single fragment of human bone was found, viz., in room 25 of the promontory house, but it will be recalled that several buried remains were observed protruding from the adjacent bank of the arroyo. On the whole the run of specimens was poorer at Galisteo than anywhere else, though the variety measures well up to the average.<sup>1</sup>

The excavations prove very clearly that there are ruins of prehistoric as well as of historic date at Galisteo. But owing to the nature of the building material employed here it is difficult to draw any sound comparisons between this and the other pueblos as to relative age, date of abandonment, etc. There are numerous adobe ruins in the vicinity and from these it is evident that a building left to itself will deteriorate and crumble in a very few years. After being reduced to a heap the winds and rains begin the work of leveling out the debris and this process also goes forward pretty rapidly, but just how rapidly cannot be stated. Perhaps when more excavation has been done on the Galisteo ruins and when it is made certain whether the abandonment of the historic pueblo was in 1680 or in 1794, it may be possible to make a rough estimate on the date of the evacuation of the prehistoric buildings. A thorough examination of the refuse heaps must also yield valuable data bearing on the chronological position of the pueblo.

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<sup>1</sup> Mr. José Ortiz, a member of the merchant firm resident at the modern Galisteo settlement, has in his possession a copper "bell" said to have been found in the ruins of Pueblo Galisteo. This bell is not of the cast type, being made of two thin trapezoidal sheets of metal partly dovetailed and partly soldered together. The lower edge is folded back over a metal ring. The portion forming the top, which fitted on as a sort of cap and was riveted to the body, is missing. The following measurements were taken of the specimen:

Inside basal diameter,  $8\frac{3}{8}$  inches  
Inside top diameter, 4 inches  
Outside top diameter,  $4\frac{3}{16}$  inches  
Vertical height,  $6\frac{1}{2}$  inches

The bell bears the date 1682, preceded by what appears to be a crescent, and also a complete circle with dots and lines added as if to represent eyes, nose, beard, and possibly the body outlines of a person. The date figures are scratched into the surface and are of course fraudulent, as the Spaniards had no institutions in New Mexico at that time. Moreover, it is difficult to imagine what purpose a bell of such proportions and make could have served.

## GENERAL CONCLUSIONS.

The writing of conclusions to this barely begun study is obviously premature; but nevertheless a tentative answer can be given to some of the questions raised in the Historical Introduction and there are besides a number of outstanding facts which may properly be brought together at this time.

As to the historical problems, the investigations show that, in accordance with Bandelier's surmise, the pueblos known as Largo, Colorado, and Shé are all of pre-Spanish date. They show further that Pueblo Blanco, which Bandelier looked upon as possibly one of the five Tano mission sites, is also pre-Spanish. This strengthens the view that San Marcos was a Tano settlement and compels us to look among the remaining ruins of the Tano habitat for another mission pueblo, i. e., a site which, taken together with San Marcos, San Lazaro, Galisteo, and San Cristobal, will complete the five pueblos required by the historical records. The new site must be fully as large as any of the four known settlements in order to accommodate its share of the population attributed to the Tanos around about 1630. If the census figure, 4000 souls, is correct then the five pueblos must have averaged about 800 inhabitants each. But we are told that San Marcos had only 600 inhabitants while San Cristobal had 800 and, therefore, it follows that some of the other pueblos must have had more than 800. Now the investigations show that the historic San Cristobal could easily have housed its quota of 800, provided, however, that the entire pueblo was occupied. The same would have been the case with Galisteo, but San Lazaro is somewhat smaller than either of the two preceding and might, in common with San Marcos, have accommodated only 600 people. Consequently, if the data are correct, the missing Tano pueblo should have had about 1200 inhabitants. This strengthens our doubt about the exactness of the census figures furnished by Benavides, because if such a large pueblo had been in existence in 1630 we should certainly have known something about it.

The date of the abandonment of the four pre-Spanish ruins on the southern border of the Galisteo basin is a more difficult question. Castañeda's statement about the Teyas who sacked and destroyed the Galisteo pueblos about the year 1535 must not be taken too literally, even though Bandelier has cited traditional evidence tending to uphold it. The four pueblos in question could have held probably almost the entire Tano population and as these four settlements constitute only a small fraction of the total number



of Tano ruins it becomes improbable that they were contemporaneous or, in other words, that they were destroyed at one and the same time. A far more intensive study would be necessary to enable one to state anything positively on the subject, but the archaeological data at hand do seem to corroborate this conclusion, viz., that the four southern pueblos were not abandoned simultaneously.

One particularly interesting observation made by Espejo in 1582 was amply verified. He reported seeing many idols at the Rio Grande pueblos and also the presence of chapels, as he calls them, erected in high places. It is unfortunate that many of the statements made by this intrepid explorer cannot be accepted at face value, yet the finding of idols in the rooms of communal houses and also of shrines built on hilltops and exposed places makes it clear that he saw and reported some things correctly.

Referring to the investigation of the Galisteo ruins as such, attention may be called to several important facts. First of all the remains are of the same general nature and of the same period of time, representing unquestionably one particular but not unique phase of Pueblo culture. The pueblos investigated were uniformly large, their parts were grouped and arranged on the same general plan and their minor architectural details, such as the arrangement and size of rooms; the position, size, and special character of doors, fireplaces, etc., were identical. The circular and partly subterranean kiva was found at all but two of the pueblos, and here they may possibly have been obliterated. The refuse heap was everywhere and functioned in conformity to the usual practice as the burial mound. The surviving artifacts were of the same types, with nevertheless a local and also a stratigraphic variation in the general finish and decoration of the pottery. The artificial creation of a water supply at almost every settlement shows that the aborigines knew their habitat and that they deliberately sought to insure the permanence of their homes against the failure of natural resources. And the scarcity everywhere of indigenous animal bones in contrast to the numerous metates and manos, as well as the presence of charred maize, indicate an agricultural rather than a hunting people.

The culture of the Tanos in all its main features, so far as illustrated by artifacts, appears to be practically identical with that of the Jemez plateau. Actual close study may develop variations in decorative symbolism, but these differences will be at best no more remarkable than the similarities. One feature of interest is the scarcity and in one or two instances the apparent absence of the kiva. What the precise social or religious significance of this may be need not be considered for the present, but in contrast to the numerous kivas found at the pueblo ruins in the region to the west and northwest of the Rio Grande this absence is worthy of notice.

Finally, a few words about the influence of European contact on the Tano Pueblos. The aborigines concerned had the example and presumably the advice, as well as the occasional coercion, of Spanish colonists and missionaries in reference to the execution of many common tasks for nearly a century. Those who lived at Pueblo Galisteo enjoyed the privilege for about a hundred years more. Yet the architectural remains, so far as examined, do not reveal any marked changes or improvements. The Tanos of historic times constructed the same style of building, retained the same room dimensions, the same sort of doors, fireplaces, etc., as their ancient forefathers. It must be admitted that one single corner fireplace was found at San Cristobal, but whether this had been of the hooded type with a chimney to draw out the smoke is very doubtful. No evidence of anything corresponding to a window was found, though a single wall-niche framed with stone slabs approached the idea, but whether this was an European inspiration cannot be stated. Changes of another character were effected, however, and one of these appears in the glazed pottery. Generally speaking, the execution of glazed ornamentation on pottery seems to have degenerated in late prehistoric times, but the artists continued to use the glaze of older days. In historic times, however, they took to using another glaze and one which was probably introduced by the Spaniards. At any rate it was of a different nature from the one they were familiar with and they never learned to manage it without spoiling the desired effect. The glaze itself was probably superior to their own and it reminds one strongly of the greenish-brown glaze often seen on common earthenware and crockery of our own day.

There was a change also in the aboriginal diet and to some extent in the mode of gaining a livelihood in consequence of the introduction of domestic animals. The osseous remains, particularly of the sheep but also of the goat, the hog, the cow, and even the horse, testify plainly as to the Indian's bill of fare in historic times. Very likely this new and relatively certain source of food supply did away with the extensive cultivation of maize in the places least adapted for its production.

## TABLE OF MEASUREMENTS.

The following compilation of measurements may need a few words of explanation to be fully intelligible. The four "specific dimensions" are simply measurements taken on the respective east, west, north and south walls of the given room. These separate measurements were taken in most cases because it was soon discovered that few of the rooms were rectangular. The horizontal "average dimensions" are merely calculations based on the preceding figures. The "height" dimension represents the average of four measurements taken, one in each corner of the room.



| Bldg. | Room | Specific Dimensions |     |      |     |       |     |       |     | Average Dimensions |     |        |      |        |     |
|-------|------|---------------------|-----|------|-----|-------|-----|-------|-----|--------------------|-----|--------|------|--------|-----|
|       |      | East                |     | West |     | North |     | South |     | Breadth            |     | Length |      | Height |     |
|       |      | San Cristobal.      |     |      |     |       |     |       |     |                    |     |        |      |        |     |
|       |      | ft.                 | in. | ft.  | in. | ft.   | in. | ft.   | in. | ft.                | in. | ft.    | in.  | ft.    | in. |
| I     | 1    | 5                   | 3   | 5    | 3   | 11    | 9   | 12    |     | 5                  | 3   | 11     | 10.5 | 4      | 9   |
| "     | 4    | 7                   |     | 8    |     | 10    | 6   | 10    |     | 7                  | 6   | 10     | 3    | 4      | 9   |
| "     | 7    |                     |     | 7    |     | 7     | 9   | 7     | 6   | 7                  |     | 7      | 7.5  | 5      | 3   |
| "     | 8    | 7                   | 6   | 7    | 9   | 10    |     | 10    | 3   | 7                  | 7.5 | 10     | 1.5  | 5      | 8   |
| "     | 10   | 6                   | 6   | 7    |     | 13    |     | 13    | 3   | 6                  | 9   | 13     | 1.5  | 2      | 8   |
| "     | 11   | 7                   | 4   | 7    | 6   | 13    | 4   | 13    |     | 7                  | 5   | 13     | 2    | 3      | 9   |
| "     | 13   | 6                   | 9   | 5    | 9   | 11    | 7   | 11    | 7   | 6                  | 3   | 11     | 7    | 2      | 8   |
| "     | 14   | 6                   | 3   | 8    | 4   | 11    | 6   | 11    | 7   | 7                  | 3.5 | 11     | 6.5  | 3      | 1   |
| "     | 16   | 7                   | 2   | 7    | 4   | 10    | 6   | 10    | 3   | 7                  | 3   | 10     | 4.5  | 3      | 1   |
| "     | 17   | 7                   | 3   | 7    | 6   | 10    | 4   | 10    | 6   | 7                  | 4.5 | 10     | 5    | 3      | 1   |
| "     | 19   | 6                   | 9   | 6    | 6   | 8     | 3   | 8     | 2   | 6                  | 7.5 | 8      | 2.5  | 2      | 7   |
| "     | 20   | 7                   | 9   | 8    | 6   | 8     | 6   | 8     | 8   | 8                  | 1.5 | 8      | 7    | 2      | 8   |
| "     | 22   |                     |     |      |     |       |     |       |     | 7                  | 6   | 8      | 6    | 1      | 10  |
| "     | 23   |                     |     |      |     |       |     |       |     | 7                  | 6   | 8      | 6    | 2      |     |
| "     | 25   |                     |     |      |     |       |     |       |     | 7                  | 2   | 10     |      | 1      | 11  |
| "     | 26   |                     |     |      |     |       |     |       |     | 7                  | 6   | 10     |      | 1      | 9   |
| "     | 28   |                     |     |      |     |       |     |       |     | 8                  |     | 10     | 6    | 1      | 6   |
| "     | 29   |                     |     |      |     |       |     |       |     | 7                  | 6   | 10     | 2    | 1      | 10  |
| "     | 31   |                     |     |      |     |       |     |       |     | 8                  | 2   | 9      | 10   | 2      | 4   |
| "     | 32   |                     |     |      |     |       |     |       |     | 7                  | 4   | 9      | 10   | 2      | 4   |
| "     | 34   |                     |     |      |     |       |     |       |     | 8                  |     | 10     | 2    | 2      | 8   |
| "     | 35   |                     |     |      |     |       |     |       |     | 7                  | 6   | 10     | 2    | 2      | 8   |
| "     | 37   |                     |     |      |     |       |     |       |     | 8                  |     | 12     |      | 2      | 10  |
| "     | 38   |                     |     |      |     |       |     |       |     | 7                  | 6   | 12     |      | 2      | 10  |
| "     | 40   |                     |     |      |     |       |     |       |     | 8                  |     | 18     |      | 3      |     |
| "     | 41   |                     |     |      |     |       |     |       |     | 7                  | 6   | 18     |      | 3      |     |
| II    | 1    | 9+                  |     | 9+   |     |       |     | 7     | 8   |                    |     |        |      | 4      | 3   |
| "     | 2    | 9+                  |     | 9+   |     |       |     | 8     | 6   |                    |     |        |      | 5      |     |
| "     | 3    | 9+                  |     | 9+   |     |       |     | 6     | 3   |                    |     |        |      | 5      | 6   |
| "     | 4    | 9+                  |     | 9+   |     |       |     | 7     | 2   |                    |     |        |      | 5      |     |
| "     | 5    | 9+                  |     | 9+   |     |       |     | 7     | 5   |                    |     |        |      | 4      | 6   |
| "     | 7    | 6                   | 3   | 6    | 3   | 5     | 9   | 6     | 6   | 6                  | 1.5 | 6      | 3    | 4      | 3   |
| "     | 8    |                     |     |      |     |       |     |       |     | 6                  | 7   | 9      | 4    | 2      | 9   |
| III   | 1    | 4                   | 8   | 4    | 10  | 14    | 3   | 14    | 3   | 4                  | 9   | 14     | 3    | 2      | 9   |
| "     | 2    | 5                   | 3   | 4    | 10  | 9     | 8   | 9     | 8   | 5                  | .5  | 9      | 8    | 2      | 10  |
| "     | 3    |                     |     |      |     |       |     |       |     | 6                  |     | 9      | 10   | 2      | 10  |
| "     | 4    | 5                   | 2   | 4    | 6   | 11    | 6   | 11    | 6   | 4                  | 10  | 11     | 6    | 2      | 10  |
| "     | 5    | 8                   | 10  | 8    | 10  | 15    | 7   | 15    | 5   | 8                  | 10  | 15     | 6    | 1      | 9   |
| "     | 6    | 4                   | 6   | 4    | 8   | 10    | 9   | 10    | 9   | 4                  | 7   | 10     | 9    | 2      | 4   |
| "     | 7    | 4                   | 6   | 4    | 8   | 10    | 10  | 11    |     | 4                  | 7   | 10     | 11   | 3      |     |
| "     | 8    | 4                   | 10  | 4    | 10  | 11    | 6   | 11    | 3   | 4                  | 10  | 11     | 4.5  | 2      | 9   |

| Bldg. | Room | Specific Dimensions |     |       |     |       |     |       |     | Average Dimensions |      |        |     |        |     |  |
|-------|------|---------------------|-----|-------|-----|-------|-----|-------|-----|--------------------|------|--------|-----|--------|-----|--|
|       |      | East                |     | West  |     | North |     | South |     | Breadth            |      | Length |     | Height |     |  |
|       |      | ft.                 | in. | ft.   | in. | ft.   | in. | ft.   | in. | ft.                | in.  | ft.    | in. | ft.    | in. |  |
|       |      | San Cristobal.      |     |       |     |       |     |       |     |                    |      |        |     |        |     |  |
| III   | 9    | 4                   | 8   | 5     | 2   | 12    | 6   | 12    | 6   | 4                  | 11   | 12     | 6   | 1      | 10  |  |
| "     | 10   | 5                   | 3   | 5     |     | 10    | 6   | 10    | 6   | 5                  | 1.5  | 10     | 6   | 2      | 8   |  |
| "     | 11   | 4                   | 9   | 4     | 9   | 11    | 6   | 11    | 6   | 4                  | 9    | 11     | 6   | 2      | 5   |  |
| "     | 12   | 4                   | 10  | 4     | 8   | 11    | 6   | 11    | 6   | 4                  | 9    | 11     | 6   | 2      | 8   |  |
| "     | 13   | 4 (?)               |     | 4 (?) |     | 3     | 2   | 3     | 2   |                    |      |        |     | 2      |     |  |
| "     | 14   | 3                   | 4   | 3     | 4   | 10    |     | 10    |     | 3                  | 4    | 10     |     | 2      | 6   |  |
| "     | 15   | 5                   | 10  | 6     | 2   | 9     | 6   | 9     | 6   | 6                  |      | 9      | 6   | 2      | 5   |  |
| "     | 16   | 5                   |     | 5     |     | 15    |     | 15    |     | 5                  |      | 15     |     | 2      | 1   |  |
| "     | 17   | 5                   | 4   | 5     | 1   | 9     | 5   | 9     | 5   | 5                  | 2.5  | 9      | 5   | 1      | 11  |  |
| "     | 18   | 6                   | 4   | 6     | 8   | 9     |     | 9     | 6   | 6                  | 6    | 9      | 3   | 2      | 7   |  |
| "     | 19   | 7                   | 4   | 7     | 6   | 10    | 4   | 10    | 6   | 7                  | 5    | 10     | 5   | 2      | 8   |  |
| "     | 20   | 7                   | 3   | 6     | 6   | 9     | 9   | 10    | 1   | 6                  | 10.5 | 9      | 11  | 2      | 10  |  |
| "     | 21   | 7                   | 2   | 7     | 5   | 9     | 6   | 9     | 6   | 7                  | 3.5  | 9      | 6   | 3      | 8   |  |
| "     | 22   | 8                   | 3   | 7     | 9   | 14    |     | 13    | 10  | 8                  |      | 13     | 11  | 3      | 3   |  |
| "     | 23   | 8                   | 8   | 8     | 3   | 9     | 5   | 9     | 5   | 8                  | 5.5  | 9      | 5   | 3      | 8   |  |
| "     | 24   | 8                   | 6   | 8     | 6   | 11    | 4   | 11    | 2   | 8                  | 6    | 11     | 3   | 3      | 10  |  |
| "     | 25   | 7                   | 9   | 8     | 9   | 9     | 6   | 9     | 8   | 8                  | 3    | 9      | 7   | 3      | 10  |  |
| "     | 26   | 8                   | 2   | 7     | 9   | 11    | 2   | 11    |     | 7                  | 11.5 | 11     | 1   | 3      | 10  |  |
| "     | 27   | 7                   | 8   | 7     | 8   | 11    | 6   | 11    | 8   | 7                  | 8    | 11     | 7   | 3      | 6   |  |
| "     | 28   | 7                   | 10  | 8     |     | 10    | 3   | 10    | 3   | 7                  | 11   | 10     | 3   | 4      | 3   |  |
| "     | 29   | 8                   | 2   | 8     |     | 8     | 8   | 8     | 8   | 8                  | 1    | 8      | 8   | 4      | 1   |  |
| "     | 30   | 7                   | 5   | 8     | 2   | 12    | 4   | 12    | 6   | 7                  | 9.5  | 12     | 5   | 4      | 3   |  |
| "     | 31   | 7                   | 6   | 7     | 3   | 12    |     | 12    |     | 7                  | 4.5  | 12     |     | 4      | 3   |  |
| "     | 32   | 8                   |     | 7     | 8   | 9     | 8   | 9     | 8   | 7                  | 10   | 9      | 8   | 3      | 7   |  |
| "     | 33   | 7                   |     | 7     | 6   | 10    | 9   | 10    | 10  | 7                  | 3    | 10     | 9.5 | 2      | 3   |  |
| "     | 34   | 8                   |     | 7     |     | 11    | 2   | 11    |     | 7                  | 6    | 11     | 1   | 2      | 8   |  |
| "     | 35   | 7                   | 3   | 9     |     | 13    | 8   | 12    | 6   | 8                  | 1.5  | 13     | 1   | 2      | 5   |  |
| "     | 36   | 7                   | 2   | 7     | 2   | 11    | 6   | 11    | 6   | 7                  | 2    | 11     | 6   | 1      | 10  |  |
| "     | 37   | 7                   | 3   | 7     | 6   | 11    | 3   | 11    | 2   | 7                  | 4.5  | 11     | 2.5 | 2      | 6   |  |
| "     | 38   | 7                   | 8   | 7     | 8   | 9     | 8   | 9     | 8   | 7                  | 8    | 9      | 8   | 3      |     |  |
| "     | 39   | 7                   | 7   | 7     | 7   | 11    | 2   | 10    | 10  | 7                  | 7    | 11     |     | 3      | 5   |  |
| "     | 40   | 7                   | 8   | 8     | 6   | 11    | 6   | 12    | 6   | 8                  | 1    | 12     |     | 3      | 7   |  |
| "     | 41   | 9                   | 6   | 9     | 6   | 10    | 6   | 10    | 6   | 9                  | 6    | 10     | 6   | 3      | 6   |  |
| "     | 42   | 10                  | 3   | 10    | 2   | 11    | 6   | 11    | 6   | 10                 | 1.5  | 11     | 6   | 3      | 8   |  |
| "     | 43   | 10                  | 3   | 9     | 10  | 11    | 6   | 11    | 6   | 10                 | .5   | 11     | 6   | 3      | 8   |  |
| "     | 44   | 9                   | 10  | 9     |     | 10    |     | 10    |     | 9                  | 5    | 10     |     | 3      | 8   |  |
| "     | 45   | 6                   | 6   | 7     | 3   | 9     | 6   | 9     | 6   | 6                  | 10.5 | 9      | 6   | 3      | 8   |  |
| "     | 46   | 8                   | 3   | 8     | 2   | 15    |     | 15    |     | 8                  | 2.5  | 15     |     | 3      | 8   |  |
| "     | 47   | 7                   |     | 5     | 10  | 10    |     | 10    |     | 6                  | 5    | 10     |     | 3      | 1   |  |
| "     | 48   | 5                   | 9   | 5     | 2   | 10    | 6   | 10    | 6   | 5                  | 5.5  | 10     | 6   | 3      |     |  |
| "     | 49   |                     |     |       |     |       |     |       |     | 7                  | 8    | 10     | 11  | 2      | 10  |  |

| Bldg. | Room | Specific Dimensions |     |      |     |       |     |       |     | Average Dimensions |      |        |      |        |     |
|-------|------|---------------------|-----|------|-----|-------|-----|-------|-----|--------------------|------|--------|------|--------|-----|
|       |      | East                |     | West |     | North |     | South |     | Breadth            |      | Length |      | Height |     |
|       |      | ft.                 | in. | ft.  | in. | ft.   | in. | ft.   | in. | ft.                | in.  | ft.    | in.  | ft.    | in. |
|       |      | San Cristobal.      |     |      |     |       |     |       |     |                    |      |        |      |        |     |
| III   | 50   |                     |     |      |     |       |     |       |     | 7                  | 4    | 9      | 9    | 4      | 4   |
| "     | 51   |                     |     |      |     |       |     |       |     | 7                  | 4    | 14     | 1    | 4      | 5   |
| "     | 52   |                     |     |      |     |       |     |       |     | 7                  |      | 10     |      | 4      | 6   |
| "     | 53   |                     |     |      |     |       |     |       |     | 7                  |      | 11     |      | 4      | 5   |
| "     | 54   |                     |     |      |     |       |     |       |     | 7                  |      | 9      | 9    | 4      | 4   |
| "     | 55   |                     |     |      |     |       |     |       |     | 7                  |      | 10     | 7    | 4      | 1   |
| "     | 56   |                     |     |      |     |       |     |       |     | 6                  | 10   | 12     |      | 4      | 4   |
| "     | 57   |                     |     |      |     |       |     |       |     | 7                  | 3    | 11     | 2    | 4      | 9   |
| "     | 58   |                     |     |      |     |       |     |       |     | 8                  |      | 9      | 6    | 4      | 8   |
| "     | 59   |                     |     |      |     |       |     |       |     | 8                  | 2    | 11     | 11   | 4      |     |
| "     | 60   |                     |     |      |     |       |     |       |     | 8                  |      | 10     | 8    | 3      | 6   |
| "     | 61   |                     |     |      |     |       |     |       |     | 7                  | 6    | 10     |      | 3      | 9   |
| "     | 62   |                     |     |      |     |       |     |       |     | 8                  | 2    | 10     | 5    | 4      | 5   |
| "     | 63   |                     |     |      |     |       |     |       |     | 8                  |      | 10     | 3    | 4      | 5   |
| "     | 64   |                     |     |      |     |       |     |       |     | 7                  | 10   | 11     | 1    | 4      |     |
| "     | 65   |                     |     |      |     |       |     |       |     | 7                  | 10   | 11     | 9    | 4      | 3   |
| "     | 66   |                     |     |      |     |       |     |       |     | 8                  |      | 10     | 11   | 3      | 10  |
| "     | 67   |                     |     |      |     |       |     |       |     | 8                  |      | 11     | 4    | 4      | 1   |
| "     | 68   |                     |     |      |     |       |     |       |     | 8                  |      | 11     | 2    | 3      | 10  |
| "     | 69   |                     |     |      |     |       |     |       |     | 8                  |      | 10     | 6    | 4      | 2   |
| "     | 70   |                     |     |      |     |       |     |       |     | 8                  |      | 10     | 9    | 3      | 7   |
| "     | 71   |                     |     |      |     |       |     |       |     | 7                  | 9    | 15     | 1    | 3      | 3   |
| "     | 72   |                     |     |      |     |       |     |       |     | 7                  | 8    | 9      | 7    | 3      | 6   |
| IV    | 1    |                     |     |      |     |       |     |       |     | 7                  | 10   | 12     |      | 6      |     |
| "     | 2    |                     |     |      |     |       |     |       |     | 7                  | 2    | 11     | 8    | 4      | 6   |
| V     | 1    | 7                   |     | 7    | 2   | 9     | 2   | 9     |     | 7                  | 1    | 9      | 1    | 3      | 5   |
| VI    | 1    | 4                   | 10  | 4    | 8   | 6     |     | 6     | 4   | 4                  | 9    | 6      | 2    | 4      |     |
| "     | 2    | 11                  | 4   | 12   | 6   | 7     | 8   | 7     | 3   | 7                  | 5.5  | 11     | 11   | 5      | 2   |
| VII   | 1    | 11                  | 9   | 12   |     | 7     |     | 6     | 9   | 6                  | 10.5 | 11     | 10.5 | 1      | 8   |
| "     | 2    | 12                  | 8   | 12   | 9   | 7     |     | 7     | 2   | 7                  | 1    | 12     | 8.5  | 2      |     |
| "     | 3    | 12                  | 10  | 13   | 2   | 7     | 6   | 7     |     | 7                  | 3    | 13     |      | 2      |     |
| "     | 4    | 13                  | 6   | 14   |     | 7     | 6   | 7     | 6   | 7                  | 6    | 13     | 9    | 2      |     |
| VIII  | 1    | 10                  |     | 10   |     | 6     |     | 6     | 6   | 6                  | 3    | 10     |      | 5      |     |
| "     | 2    | 11                  | 6   | 11   | 6   | 5     | 10  | 5     | 6   | 5                  | 8    | 11     | 6    | 2      |     |
| "     | 3    | 10                  | 7   | 12   |     | 5     | 10  | 6     | 2   | 6                  |      | 11     | 3.5  | 7      | 6   |
| "     | 4    | 6                   | 8   | 6    | 5   | 12    |     | 12    |     | 6                  | 6.5  | 12     |      | 10     |     |
| "     | 5    | 11                  | 4   | 11   | 6   | 7     | 7   | 7     | 7   | 7                  | 7    | 11     | 5    | 6      | 6   |
| "     | 6    | 5                   | 10  | 4    | 10  | 11    | 8   | 11    | 2   | 5                  | 4    | 11     | 5    | 2      | 5   |
| "     | 7    | 7                   | 6   | 6    | 11  | 12    | 8   | 12    | 10  | 7                  | 2.5  | 12     | 9    | 1      | 9   |
| IX    | 1    | 9                   | 1   | 8    | 3   | 5     | 4   | 5     | 6   | 5                  | 5    | 8      | 8    | 6      | 8   |
| "     | 2    | 8                   | 8   | 8    | 9   | 6     | 8   | 5     | 9   | 6                  | 2.5  | 8      | 8.5  | 5      | 7   |



| Bldg. | Room | Specific Dimensions |     |      |     |       |     |       |     | Average Dimensions |     |        |      |        |     |  |  |
|-------|------|---------------------|-----|------|-----|-------|-----|-------|-----|--------------------|-----|--------|------|--------|-----|--|--|
|       |      | East                |     | West |     | North |     | South |     | Breadth            |     | Length |      | Height |     |  |  |
|       |      | ft.                 | in. | ft.  | in. | ft.   | in. | ft.   | in. | ft.                | in. | ft.    | in.  | ft.    | in. |  |  |
|       |      | San Cristobal       |     |      |     |       |     |       |     |                    |     |        |      |        |     |  |  |
| IX    | 3    | 23                  |     | 23   |     | 7     | 8   | 8     | 10  | 8                  | 3   | 23     |      | 6      | 2   |  |  |
| "     | 4    | 9                   | 10  | 9    | 10  | 14    |     | 14    |     | 9                  | 10  | 14     |      | 5      | 7   |  |  |
| "     | 5    | 11                  | 4   | 9    | 4   | 21    | 2   | 21    | 2   | 10                 | 4   | 21     | 2    | 5      | 9   |  |  |
| "     | 6    | 8                   | 7   | 9    | 3   | 6     | 6   | 6     | 6   | 6                  | 6   | 8      | 11   | 6      | 9   |  |  |
| "     | 7    | 7                   | 6   | 8    |     | 9     | 5   | 10    | 6   | 7                  | 9   | 9      | 11.5 | 7      | 7   |  |  |
| "     | 8    | 8                   | 3   | 8    | 2   | 5     |     | 5     |     | 5                  |     | 8      | 2.5  | 3      | 2   |  |  |
| "     | 9    | 7                   |     | 6    | 8   | 6     |     | 6     |     | 6                  |     | 6      | 10   | 3      | 4   |  |  |
| "     | 10   | 9                   | 8   | 9    |     | 6     | 8   | 6     | 8   | 6                  | 8   | 9      | 4    | 4      |     |  |  |
| "     | 13   | 9                   | 4   | 10   |     | 6     | 6   | 6     | 6   | 6                  | 6   | 9      | 8    | 7      |     |  |  |
| "     | 14   | 8                   | 4   | 8    | 4   | 7     | 3   | 7     | 3   | 7                  | 3   | 8      | 4    | 6      | 6   |  |  |
| "     | 15   | 9                   |     | 9    |     | 7     | 2   | 8     |     | 7                  | 7   | 9      |      | 7      | 3   |  |  |
| "     | 16   | 10                  | 6   | 10   | 2   | 6     | 4   | 6     | 9   | 6                  | 6.5 | 10     | 4    | 6      | 6   |  |  |
| "     | 17   | 10                  | 8   | 11   | 6   | 7     | 2   | 7     | 8   | 7                  | 5   | 11     | 1    | 6      |     |  |  |
| "     | 18   | 7                   | 6   | 7    | 6   | 7     | 4   | 7     | 4   | 7                  | 4   | 7      | 6    | 5      | 8   |  |  |
| "     | 19   | 9                   | 4   | 8    | 9   | 6     | 3   | 6     | 4   | 6                  | 3.5 | 9      | .5   | 5      | 9   |  |  |
| "     | 20   | 9                   |     | 9    |     | 10    |     | 10    |     | 9                  |     | 10     |      | 5      | 10  |  |  |
| "     | 21   | 9                   |     | 9    |     | 10    |     | 10    |     | 9                  |     | 10     |      | 5      | 9   |  |  |
| "     | 22   | 9                   | 4   | 9    | 5   | 7     | 7   | 6     | 7   | 7                  | 1   | 9      | 4.5  | 7      | 10  |  |  |
| "     | 23   | 8                   | 2   | 7    | 2   | 6     |     | 6     |     | 6                  |     | 7      | 8    | 7      | 11  |  |  |
| "     | 24   | 10                  | 4   | 10   |     | 6     |     | 6     | 6   | 6                  | 3   | 10     | 2    | 7      | 9   |  |  |
| "     | 25   | 9                   |     | 8    | 10  | 6     | 5   | 6     | 10  | 6                  | 7.5 | 8      | 11   | 7      | 5   |  |  |
| "     | 26   | 8                   | 9   | 8    | 6   | 6     | 7   | 6     | 4   | 6                  | 5.5 | 8      | 7.5  | 6      | 9   |  |  |
| "     | 27   | 11                  | 6   | 12   |     | 9     | 1   | 8     | 9   | 8                  | 11  | 11     | 9    | 6      | 1   |  |  |
| "     | 28   | 8                   | 10  | 8    | 10  | 8     | 3   | 8     |     | 8                  | 1.5 | 8      | 10   | 4      |     |  |  |
| "     | 29   | 5                   | 2   | 5    | 7   | 10    | 9   | 10    | 9   | 5                  | 4.5 | 10     | 9    | 5      | 5   |  |  |
| "     | 30   | 5                   | 3   | 5    | 3   | 10    | 7   | 10    | 7   | 5                  | 3   | 10     | 7    | 1      | 7   |  |  |
| X     | 1    |                     |     | 6    | 6   | 11    | 9   |       |     |                    |     |        |      | 6      | 3   |  |  |
| "     | 2    | 6                   | 6   | 6    | 9   | 10    | 4   | 10    | 4   | 6                  | 7.5 | 10     | 4    | 6      | 9   |  |  |
| "     | 3    | 6                   | 9   | 7    | 4   | 10    | 6   | 10    | 6   | 7                  | .5  | 10     | 6    | 6      |     |  |  |
| "     | 4    | 7                   | 6   | 7    | 2   | 10    | 4   | 10    | 4   | 7                  | 4   | 10     | 4    | 7      | 6   |  |  |
| "     | 5    | 7                   | 2   | 6    | 2   | 13    | 6   | 13    | 4   | 6                  | 8   | 13     | 5    | 3      | 6   |  |  |
| "     | 6    | 6                   |     | 6    |     | 12    |     | 12    |     | 6                  |     | 12     |      | 5      |     |  |  |
| "     | 7    | 5                   | 6   | 7    |     | 9     | 9   | 9     | 9   | 6                  | 3   | 9      | 9    | 5      | 6   |  |  |
| "     | 8    | 6                   | 9   | 7    | 4   | 10    | 9   | 10    | 6   | 7                  | .5  | 10     | 7.5  | 10     |     |  |  |
| "     | 9    | 7                   | 3   | 6    | 10  | 10    | 4   | 10    | 4   | 7                  | .5  | 10     | 4    | 6      |     |  |  |
| "     | 10   | 6                   | 10  | 9    |     | 13    |     | 12    | 10  | 7                  | 11  | 12     | 11   | 5      |     |  |  |
| "     | 11   | 7                   | 3   | 7    | 3   | 12    |     | 12    |     | 7                  | 3   | 12     |      | 8      |     |  |  |
| "     | 12   | 7                   |     | 7    |     | 10    | 1   | 10    | 1   | 7                  |     | 10     | 1    | 8      | 3   |  |  |
| "     | 13   | 7                   |     | 7    |     | 11    |     | 11    |     | 7                  |     | 11     |      | 8      |     |  |  |
| "     | 14   | 7                   |     | 7    |     | 11    |     | 11    |     | 7                  |     | 11     |      | 9      |     |  |  |
| "     | 15   | 7                   |     | 7    |     | 13    |     | 13    |     | 7                  |     | 13     |      | 8      | 6   |  |  |

| Bldg. | Room | Specific Dimensions |     |      |     |       |     |       |     | Average Dimensions |      |        |     |        |     |
|-------|------|---------------------|-----|------|-----|-------|-----|-------|-----|--------------------|------|--------|-----|--------|-----|
|       |      | East                |     | West |     | North |     | South |     | Breadth            |      | Length |     | Height |     |
|       |      | San Cristobal       |     |      |     |       |     |       |     |                    |      |        |     |        |     |
|       |      | ft.                 | in. | ft.  | in. | ft.   | in. | ft.   | in. | ft.                | in.  | ft.    | in. | ft.    | in. |
| X     | 16   | 6                   | 6   | 6    | 6   | 12    |     | 12    |     | 6                  | 6    | 12     |     | 8      |     |
| "     | 17   | 6                   | 3   | 6    | 3   | 10    |     | 10    |     | 6                  | 3    | 10     |     | 8      | 3   |
| "     | 18   | 6                   | 3   | 6    | 3   | 11    |     | 11    |     | 6                  | 3    | 11     |     | 8      |     |
| "     | 19   | 7                   |     | 7    |     | 11    |     | 11    |     | 7                  |      | 11     |     | 9      |     |
| "     | 20   | 7                   |     | 7    |     | 13    |     | 13    |     | 7                  |      | 13     |     | 8      | 6   |
| "     | 21   | 9                   | 3   | 7    | 9   | 11    | 6   | 11    | 6   | 8                  | 6    | 11     | 6   | 7      | 6   |
| "     | 22   | 7                   | 9   | 7    | 9   | 10    |     | 10    |     | 7                  | 9    | 10     |     | 8      |     |
| "     | 23   | 7                   | 9   | 7    | 9   | 11    |     | 11    |     | 7                  | 9    | 11     |     | 8      |     |
| "     | 24   | 7                   | 6   | 7    | 6   | 11    |     | 11    |     | 7                  | 6    | 11     |     | 9      |     |
| "     | 25   | 7                   | 6   | 7    | 6   | 13    |     | 13    |     | 7                  | 6    | 13     |     | 8      | 6   |
| "     | 26   | 7                   |     | 7    | 4   | 11    | 5   | 11    | 4   | 7                  | 2    | 11     | 4.5 | 9      | 6   |
| "     | 27   | 7                   |     | 7    |     | 11    | 4   | 11    | 4   | 7                  |      | 11     | 4   | 9      | 6   |
| XI    | 1    | 10                  |     | 10   |     | 8     | 4   | 8     | 4   | 8                  | 4    | 10     |     | 8      | 6   |
| XII   | 1    | 8                   |     | 8    |     | 11    | 1   | 11    | 1   | 8                  |      | 11     | 1   | 2      | 3   |
| "     | 2    | 8                   | 4   | 8    | 11  | 10    | 7   | 10    | 9   | 8                  | 7.5  | 10     | 8   | 4      | 4   |
| "     | 3    | 9                   |     | 8    | 10  | 10    | 10  | 11    | 3   | 8                  | 11   | 11     | .5  | 3      | 5   |
| "     | 4    | 9                   | 2   | 8    | 2   | 10    |     | 10    | 8   | 8                  | 8    | 10     | 4   | 3      | 8   |
| "     | 5    | 8                   | 5   | 8    | 2   | 10    | 8   | 10    | 5   | 8                  | 3.5  | 10     | 6.5 | 4      | 8   |
| "     | 6    | 7                   | 9   | 8    | 2   | 9     | 10  | 10    | 3   | 7                  | 11.5 | 10     | .5  | 4      | 3   |
| XIII  | 1    | 11                  | 10  | 12   | 8   | 4     | 9   | 4     | 6   | 4                  | 7.5  | 12     | 3   | 3      | 2   |
| "     | 2    | 9                   | 10  | 10   | 10  | 5     | 6   | 6     | 7   | 6                  | .5   | 10     | 4   | 3      | 4   |
| "     | 3    | 9                   | 3   | 9    | 3   | 7     |     | 7     |     | 7                  |      | 9      | 3   | 4      | 10  |
| "     | 4    | 11                  |     | 11   | 3   | 7     | 4   | 7     | 4   | 7                  | 4    | 11     | 1.5 | 4      | 7   |
| "     | 5    | 10                  | 6   | 11   |     | 9     |     | 7     | 10  | 8                  | 5    | 10     | 9   | 4      | 3   |
| "     | 6    | 9                   | 10  | 9    | 10  | 7     | 10  | 7     | 10  | 7                  | 10   | 9      | 10  | 4      | 8   |
| "     | 7    | 12                  | 6   | 13   |     | 7     | 2   | 7     | 10  | 7                  | 6    | 12     | 9   | 4      | 9   |
| "     | 8    | 11                  | 10  | 12   | 10  | 8     |     | 7     | 5   | 7                  | 8.5  | 12     | 4   | 4      | 6   |
| "     | 9    | 11                  | 2   | 10   | 11  | 7     | 10  | 8     |     | 7                  | 11   | 11     | .5  | 3      | 7   |
| "     | 10   | 11                  | 3   | 11   | 6   | 8     | 3   | 8     | 3   | 8                  | 3    | 11     | 4.5 | 3      |     |
| "     | 11   | 11                  | 4   | 11   | 8   | 7     | 5   | 7     | 2   | 7                  | 3.5  | 11     | 6   | 3      | 4   |
| "     | 12   | 11                  | 1   | 11   |     | 7     | 5   | 7     | 5   | 7                  | 5    | 11     | .5  | 5      | 11  |
| XIV   | 1    | 11                  | 6   | 11   | 7   | 4     | 8   | 4     | 8   | 4                  | 8    | 11     | 6.5 | 4      | 3   |
| "     | 2    | 13                  | 6   | 13   | 6   | 5     | 4   | 4     | 7   | 4                  | 11.5 | 13     | 6   | 4      | 5   |
| XV    | 1    | 11                  | 3   | 11   | 3   | 8     | 4   | 8     | 8   | 8                  | 6    | 11     | 3   | 5      | 7   |
| "     | 2    | 8                   | 10  | 8    | 7   | 10    |     | 9     | 10  | 8                  | 8.5  | 9      | 11  | 5      | 7   |
| "     | 3    | 9                   | 5   | 9    | 10  | 5     |     | 5     | 3   | 5                  | 1.5  | 9      | 7.5 | 4      | 2   |
| "     | 4    | 4                   | 4   | 4    | 5   | 9     | 10  | 9     | 3   | 4                  | 4.5  | 9      | 6.5 | 2      | 10  |
| XVI   | 1    | 5                   | 4   | 5    | 9   | 11    | 2   | 11    | 9   | 5                  | 6.5  | 11     | 5.5 | 4      | 11  |
| "     | 2    | 8                   | 8   | 8    |     | 11    | 10  | 11    | 9   | 8                  | 4    | 11     | 9.5 | 5      |     |
| XVII  | 1    | 9                   | 7   | 9    | 4   | 6     | 7   | 6     | 6   | 6                  | 6.5  | 9      | 5.5 | 1      | 11  |
| "     | 2    | 10                  | 1   | 9    | 5   | 6     | 5   | 6     | 9   | 6                  | 7    | 9      | 9   | 2      | 1   |

| Bldg. | Room | Specific Dimensions |     |      |     |                  |     |       |     | Average Dimensions |      |        |       |        |      |
|-------|------|---------------------|-----|------|-----|------------------|-----|-------|-----|--------------------|------|--------|-------|--------|------|
|       |      | East                |     | West |     | North            |     | South |     | Breadth            |      | Length |       | Height |      |
|       |      |                     |     |      |     | San Cristobal    |     |       |     |                    |      |        |       |        |      |
|       |      | ft.                 | in. | ft.  | in. | ft.              | in. | ft.   | in. | ft.                | in.  | ft.    | in.   | ft.    | n.   |
| XVII  | 3    | 9                   | 6   | 9    | 10  | 6                | 7   | 6     | 9   | 6                  | 8    | 9      | 8     | 2      | 7    |
| "     | 4    | 4                   | 6   | 4    | 10  | 10               | 1   | 9     | 9   | 4                  | 8    | 9      | 11    | 2      | 6    |
| "     | 5    | 5                   |     | 5    |     | 11               | 9   | 12    |     | 5                  |      | 11     | 11.5  | 2      | 1    |
| XIX   | 1    |                     |     |      |     |                  |     |       |     | 7                  |      | 12     |       | 5      | 6    |
|       |      |                     |     |      |     | General Averages |     |       |     | 7                  | 1.28 | 10     | 11.35 | 4      | 4.89 |
|       |      |                     |     |      |     | Pueblo Largo     |     |       |     |                    |      |        |       |        |      |
|       |      |                     |     |      |     |                  |     |       |     |                    |      |        |       |        |      |
| I     | 1    | 6                   | 3   | 6    | 1   | 13               | 5   | 13    | 8   | 6                  | 2    | 13     | 6.5   | 5      | 6    |
| "     | 2    | 6                   | 5   | 5    | 6   | 9                | 4   | 9     | 10  | 5                  | 11.5 | 9      | 7     | 6      |      |
| II    | 1    | 13                  |     | 13   |     | 6                | 7   | 7     | 1   | 6                  | 10   | 13     |       | 5      | 6    |
| "     | 2    | 11                  | 2   | 10   | 10  | 5                | 3   | 4     | 9   | 5                  |      | 11     |       | 6      |      |
| III   | 1    | 7                   |     | 7    | 8   | 15               | 4   | 14    | 10  | 7                  | 4    | 15     | 1     | 4      |      |
| "     | 2    | 8                   | 6   | 8    | 4   | 13               | 4   | 13    |     | 8                  | 5    | 13     | 2     | 3      | 6    |
| IV    | 1    | 11                  | 8   | 11   | 5   | 6                | 10  | 6     | 7   | 6                  | 8.5  | 11     | 6.5   | 2      | 6    |
| "     | 2    | 11                  | 6   | 11   | 6   | 7                | 6   | 7     | 3   | 7                  | 4.5  | 11     | 6     | 6      |      |
| "     | 3    | 7                   | 3   | 8    | 2   | 7                | 8   | 8     | 2   | 7                  | 8.5  | 7      | 11    | 5      | 6    |
| "     | 4    | 6                   | 2   | 6    | 2   | 11               |     | 11    | 5   | 6                  | 2    | 11     | 2.5   | 5      | 9    |
| V     | 1    | 11                  | 8   | 11   |     | 5                | 4   | 6     |     | 5                  | 8    | 11     | 4     | 4      | 3    |
| "     | 2    | 6                   | 8   | 7    | 8   | 11               | 6   | 11    | 6   | 7                  | 2    | 11     | 6     | 4      | 6    |
| "     | 3    | 11                  | 4   | 12   | 4   | 7                | 2   | 6     | 1   | 6                  | 7.5  | 11     | 10    | 2      | 6    |
|       |      |                     |     |      |     | General Averages |     |       |     | 6                  | 8.42 | 11     | 8.5   | 4      | 8.77 |
|       |      |                     |     |      |     | Pueblo Colorado  |     |       |     |                    |      |        |       |        |      |
|       |      |                     |     |      |     |                  |     |       |     |                    |      |        |       |        |      |
| I     | 1    | 11                  | 3   | 10   | 11  | 6                |     | 6     |     | 6                  |      | 11     | 1     | 2      | 5    |
| "     | 2    | 12                  | 3   | 11   | 4   | 7                | 11  | 8     | 2   | 8                  | .5   | 11     | 9.5   | 2      | 7    |
| II    | 1    | 12                  | 6   | 11   | 9   | 6                | 8   | 7     | 4   | 7                  |      | 12     | 1.5   | 5      | 7    |
| III   | 1    | 5                   | 7   | 6    | 5   | 13               | 1   | 13    | 9   | 6                  |      | 13     | 5     | 4      |      |
| "     | 2    | 6                   | 8   | 6    | 10  | 10               | 10  | 11    | 3   | 6                  | 9    | 11     | .5    | 6      | 10   |
| "     | 3    | 6                   | 3   | 5    | 9   | 12               | 6   | 11    | 8   | 6                  |      | 12     | 1     | 6      | 5    |
| "     | 4    | 11                  | 6   | 11   | 10  | 7                | 7   | 7     | 2   | 7                  | 4.5  | 11     | 8     | 6      | 3    |
| IV    | 1    | 10                  | 7   | 11   | 6   | 6                | 6   | 5     | 11  | 6                  | 2.5  | 11     | .5    | 2      | 6    |
| "     | 2    | 10                  | 10  | 10   | 7   | 6                | 1   | 6     |     | 6                  | .5   | 10     | 8.5   | 4      | 5    |
| "     | 3    | 13                  | 2   | 12   | 9   | 5                | 3   | 5     | 3   | 5                  | 3    | 12     | 11.5  | 4      | 6    |
| "     | 4    | 12                  | 8   | 12   | 3   | 5                | 6   | 5     | 9   | 5                  | 7.5  | 12     | 5.5   | 4      | 9    |
| "     | 5    | 8                   | 3   | 8    | 3   | 5                | 10  | 6     |     | 5                  | 11   | 8      | 3     | 5      | 1    |



| Bldg.            | Room | Specific Dimensions |     |      |     |       |     |       |     | Average Dimensions |      |        |      |        |     |
|------------------|------|---------------------|-----|------|-----|-------|-----|-------|-----|--------------------|------|--------|------|--------|-----|
|                  |      | East                |     | West |     | North |     | South |     | Breadth            |      | Length |      | Height |     |
|                  |      | Pueblo Colorado     |     |      |     |       |     |       |     |                    |      |        |      |        |     |
|                  |      | ft.                 | in. | ft.  | in. | ft.   | in. | ft.   | in. | ft.                | in.  | ft.    | in.  | ft.    | in. |
| IV               | 6    | 11                  |     | 11   | 3   | 7     | 2   | 5     | 9   | 6                  | 5.5  | 11     | 1.5  | 4      | 10  |
| "                | 7    | 11                  | 5   | 11   | 3   | 5     | 9   | 5     | 5   | 5                  | 7    | 11     | 4    | 4      | 4   |
| "                | 8    | 10                  | 9   | 10   | 6   | 5     | 8   | 5     | 6   | 5                  | 7    | 10     | 7.5  | 3      | 5   |
| "                | 9    | 11                  | 11  | 11   | 10  | 5     | 11  | 5     | 3   | 5                  | 7    | 11     | 10.5 | 3      | 5   |
| "                | 10   | 9                   | 11  | 10   |     | 6     | 6   | 6     | 11  | 6                  | 8.5  | 9      | 11.5 | 3      |     |
| "                | 11   | 10                  | 10  | 11   | 2   | 6     | 10  | 6     | 5   | 6                  | 7.5  | 11     |      | 4      |     |
| "                | 12   | 13                  | 3   | 13   |     | 6     | 10  | 7     | 3   | 7                  | .5   | 13     | 1.5  | 4      | 10  |
| "                | 13   | 12                  | 7   | 12   | 6   | 7     | 3   | 7     | 1   | 7                  | 2    | 12     | 6.5  | 5      | 6   |
| "                | 14   | 9                   | 1   | 8    | 4   | 7     | 2   | 7     | 2   | 7                  | 2    | 8      | 8.5  | 5      | 2   |
| "                | 15   | 11                  | 4   | 11   | 3   | 7     |     | 6     | 4   | 6                  | 8    | 11     | 3.5  | 4      | 10  |
| "                | 16   | 10                  | 10  | 11   | 4   | 6     | 3   | 6     | 5   | 6                  | 4    | 11     | 1    | 4      | 7   |
| "                | 17   | 11                  | 5   | 11   |     | 6     | 5   | 6     | 10  | 6                  | 7.5  | 11     | 2.5  | 4      | 3   |
| "                | 18   | 9                   | 8   | 10   | 8   | 6     | 7   | 7     | 3   | 6                  | 11   | 10     | 2    | 3      |     |
| "                | 19   | 13                  | 5   | 13   | 5   | 6     | 6   | 5     | 9   | 6                  | 1.5  | 13     | 5    | 5      | 2   |
| "                | 20   | 12                  | 6   | 12   | 4   | 5     | 5   | 5     | 6   | 5                  | 5.5  | 12     | 5    | 4      | 6   |
| "                | 21   | 9                   | 8   | 9    | 2   | 6     | 5   | 6     | 2   | 6                  | 3.5  | 9      | 5    | 4      | 10  |
| "                | 22   | 10                  | 9   | 11   | 1   | 6     | 4   | 6     | 3   | 6                  | 3.5  | 10     | 11   | 3      | 9   |
| "                | 23   | 10                  | 11  | 11   | 3   | 5     | 2   | 4     | 10  | 5                  |      | 11     | 1    | 3      | 4   |
| "                | 24   | 12                  | 3   | 11   | 11  | 5     | 9   | 5     | 2   | 5                  | 5.5  | 12     | 1    | 3      | 7   |
| "                | 25   | 13                  | 1   | 13   | 3   | 6     | 9   | 7     | 3   | 7                  |      | 13     | 2    | 3      | 3   |
| "                | 26   | 11                  | 10  | 12   | 6   | 6     | 10  | 6     | 5   | 6                  | 7.5  | 12     | 2    | 3      | 1   |
| "                | 27   | 10                  |     | 9    | 9   | 6     | 7   | 6     | 5   | 6                  | 6    | 9      | 10.5 | 3      | 10  |
| "                | 28   | 12                  | 2   | 11   | 11  | 4     | 5   | 4     | 7   | 4                  | 6    | 12     | .5   | 2      | 3   |
| V                | 1    | 6                   | 1   | 6    | 1   | 9     | 3   | 9     | 9   | 6                  | 1    | 9      | 6    | 5      | 6   |
| "                | 2    | 7                   | 10  | 7    | 9   | 11    | 8   | 11    | 7   | 7                  | 9.5  | 11     | 7.5  | 5      | 6   |
| VI               | 1    | 11                  | 6   | 11   | 10  | 7     | 1   | 7     | 8   | 7                  | 4.5  | 11     | 8    | 5      | 7   |
| VIII             | 1    | 13                  | 2   | 12   | 6   | 6     | 5   | 6     | 8   | 6                  | 6.5  | 12     | 10   | 5      | 6   |
| IX               | 1    | 6                   | 3   | 6    | 10  | 10    | 11  | 10    | 11  | 6                  | 6.5  | 10     | 11   | 5      | 10  |
| General Averages |      |                     |     |      |     |       |     |       |     | 6                  | 4.28 | 11     | 4.74 | 4      | 4.8 |
| Pueblo Shé       |      |                     |     |      |     |       |     |       |     |                    |      |        |      |        |     |
| I                | 1    | 6                   | 10  | 6    | 9   | 15    |     | 15    | 2   | 6                  | 9.5  | 15     | 1    | 4      | 8   |
| "                | 2    | 10                  | 2   | 10   | 4   | 6     | 3   | 6     | 3   | 6                  | 3    | 10     | 3    | 5      | 6   |
| II               | 1    | 6                   | 6   | 6    | 9   | 11    | 9   | 11    | 9   | 6                  | 7.5  | 11     | 9    | 4      | 6   |
| "                | 2    | 6                   | 7   | 6    | 2   | 10    | 7   | 10    | 11  | 6                  | 4.5  | 10     | 9    | 4      | 7   |
| "                | 3    | 11                  | 9   | 11   | 10  | 8     | 2   | 7     | 11  | 8                  | .5   | 11     | 9.5  | 4      | 5   |
| "                | 4    | 11                  | 8   | 10   | 1   | 7     | 1   | 7     | 1   | 7                  | 1    | 10     | 10.5 | 4      | 2   |
| "                | 5    | 12                  | 4   | 12   | 5   | 5     | 2   | 5     | 2   | 5                  | 2    | 12     | 4.5  | 3      |     |

| Bldg.            | Room | Specific Dimensions |     |      |     |       |     |       |     | Average Dimensions |      |        |      |        |      |
|------------------|------|---------------------|-----|------|-----|-------|-----|-------|-----|--------------------|------|--------|------|--------|------|
|                  |      | East                |     | West |     | North |     | South |     | Breadth            |      | Length |      | Height |      |
|                  |      | ft.                 | in. | ft.  | in. | ft.   | in. | ft.   | in. | ft.                | in.  | ft.    | in.  | ft.    | in.  |
|                  |      | Pueblo Shé          |     |      |     |       |     |       |     |                    |      |        |      |        |      |
| III              | 1    | 15                  | 5   | 15   | 5   | 6     | 11  | 7     |     | 6                  | 11.5 | 15     | 5    | 4      | 1    |
| IV               | 1    | 5                   | 10  | 5    | 10  | 10    | 5   | 10    | 4   | 5                  | 10   | 10     | 4.5  | 5      |      |
| "                | 2    | 8                   | 8   | 8    | 8   | 7     | 10  | 7     | 4   | 7                  | 7    | 8      | 8    | 5      | 6    |
| "                | 3    | 7                   | 4   | 7    | 8   | 10    | 6   | 10    | 5   | 7                  | 6    | 10     | 5.5  | 5      | 10   |
| "                | 4    | 9                   | 9   | 9    | 9   | 6     | 9   | 6     | 9   | 6                  | 9    | 9      | 9    | 5      |      |
| V                | 1    | 7                   | 8   | 7    | 10  | 11    | 10  | 12    | 5   | 7                  | 9    | 12     | 1.5  | 4      | 8    |
| "                | 2    | 14                  |     | 13   | 9   | 7     | 10  | 7     | 3   | 7                  | 6.5  | 13     | 10.5 | 5      | 7    |
| VI               | 1    | 9                   | 7   | 9    | 8   | 6     | 1   | 5     | 4.5 | 5                  | 8.75 | 9      | 7.5  | 4      |      |
| VII              | 1    | 6                   | 7   | 6    |     | 13    | 4   | 13    | 5   | 6                  | 3.5  | 13     | 4.5  | 4      | 9    |
| VIII             | 1    | 9                   | 10  | 9    | 10  | 7     | 9   | 7     | 8   | 7                  | 8.5  | 9      | 10   | 4      | 8    |
| IX               | 1    | 6                   | 6   | 7    |     | 9     | 10  | 10    | 5   | 6                  | 9    | 10     | 1.5  | 5      | 2    |
| "                | 2    | 7                   | 4   | 7    | 8   | 11    | 3   | 10    | 11  | 7                  | 6    | 11     | 1    | 3      | 5    |
| X                | 1    | 7                   | 3   | 7    | 3   | 12    | 2   | 12    |     | 7                  | 3    | 12     | 1    | 3      | 4    |
| "                | 2    | 7                   | 1   | 7    | 2   | 12    | 9   | 12    | 5   | 7                  | 1.5  | 12     | 7    | 3      |      |
| XI               | 1    | 5                   | 10  | 5    | 11  | 9     | 2   | 9     | 2   | 5                  | 10.5 | 9      | 2    | 2      | 6    |
| "                | 2    | 6                   | 2   | 6    | 3   | 11    | 3   | 11    | 9   | 6                  | 2.5  | 11     | 6    | 2      | 4    |
| XII              | 1    | 10                  | 9   | 11   | 4   | 7     | 10  | 7     | 7   | 7                  | 8.5  | 11     | .5   | 1      | 10   |
| XIII             | 1    | 10                  | 2   | 10   | 2   | 8     | 2   | 8     | 2   | 8                  | 2    | 10     | 2    | 3      | 4    |
| XIV              | 1    | 11                  | 2   | 11   | 6   | 6     | 8   | 6     | 8   | 6                  | 8    | 11     | 4    | 3      | 1    |
| "                | 2    | 7                   | 9   | 7    | 9   | 10    | 3   | 10    | 3   | 7                  | 9    | 10     | 3    | 3      | 10   |
| General Averages |      |                     |     |      |     |       |     |       |     | 6                  | 11.1 | 11     | 3.87 | 4      | 1.67 |
|                  |      | Pueblo Blanco       |     |      |     |       |     |       |     |                    |      |        |      |        |      |
| I                | 1    | 5                   | 7   | 5    | 10  | 19    | 2   | 19    |     | 5                  | 8.5  | 19     | 1    | 4      | 9    |
| II               | 1    | 9                   | 6   | 9    | 5   | 6     |     | 6     | 10  | 6                  | 5    | 9      | 9.5  | 3      | 2    |
| III              | 1    | 6                   | 3   | 6    | 6   | 15    | 4   | 15    | 3   | 6                  | 4.5  | 15     | 3.5  | 2      | 8    |
| IV               | 1    | 7                   | 4   | 6    | 7   | 10    | 11  | 10    | 10  | 6                  | 11.5 | 10     | 10.5 | 3      | 9    |
| V                | 1    | 6                   | 3   | 6    | 5   | 18    | 9   | 19    | 2   | 6                  | 4    | 18     | 11.5 | 4      | 3    |
| "                | 2    | 15                  | 2   | 14   | 11  | 6     | 2   | 5     | 6   | 5                  | 10   | 15     | .5   | 5      |      |
| "                | 3    | 8                   |     | 7    | 7   | 12    | 1   | 12    | 1   | 7                  | 9.5  | 12     | 1    | 4      |      |
| VI               | 1    | 10                  | 7   | 10   | 3   | 6     | 5   | 6     | 6   | 6                  | 5.5  | 10     | 5    | 4      | 4    |
| VII              | 1    | 12                  |     | 11   | 9   | 5     | 4   | 5     | 1   | 5                  | 2.5  | 11     | 10.5 | 4      | 4    |
| VIII             | 1    | 5                   | 6   | 6    |     | 13    |     | 13    | 3   | 5                  | 9    | 13     | 1.5  | 4      | 2    |
| IX               | 1    | 7                   | 8   | 7    | 6   | 5     | 9   | 5     | 9   | 5                  | 9    | 7      | 7    | 4      | 9    |
| X                | 1    | 9                   | 8   | 9    | 9   | 6     | 7   | 7     | 2   | 6                  | 10.5 | 9      | 8.5  | 6      |      |
| "                | 2    | 7                   | 6   | 7    | 3   | 15    | 7   | 15    | 3   | 7                  | 4.5  | 15     | 5    | 6      | 5    |
| "                | 3    | 9                   | 2   | 9    | 11  | 9     |     | 8     | 3   | 8                  | 7.5  | 9      | 6.5  | 6      | 3    |
| "                | 4    | 8                   | 5   | 7    | 2   | 6     | 5   | 6     | 5   | 6                  | 5    | 7      | 9.5  | 5      | 10   |

| Bldg.             | Room | Specific Dimensions |     |      |     |       |     |       |     | Average Dimensions |      |        |      |        |       |  |  |
|-------------------|------|---------------------|-----|------|-----|-------|-----|-------|-----|--------------------|------|--------|------|--------|-------|--|--|
|                   |      | East                |     | West |     | North |     | South |     | Breadth            |      | Length |      | Height |       |  |  |
|                   |      | Pueblo Blanco       |     |      |     |       |     |       |     |                    |      |        |      |        |       |  |  |
|                   |      | ft.                 | in. | ft.  | in. | ft.   | in. | ft.   | in. | ft.                | in.  | ft.    | in.  | ft.    | in.   |  |  |
| XI                | 1    | 6                   | 4   | 6    | 9   | 14    | 8   | 15    | 1   | 6                  | 6.5  | 14     | 10.5 | 6      | 2     |  |  |
| "                 | 2    | 7                   | 11  | 6    | 8   | 11    |     | 11    | 4   | 7                  | 3.5  | 11     | 2    | 4      | 4     |  |  |
| XII               | 1    | 7                   | 5   | 7    | 10  | 11    |     | 11    | 1   | 7                  | 7.5  | 11     | .5   | 5      | 6     |  |  |
| "                 | 4    | 8                   | 8   | 9    | 1   | 8     |     | 7     | 7   | 7                  | 9.5  | 8      | 10.5 | 3      | 9     |  |  |
| "                 | 5    | 5                   | 10  | 6    | 4   | 12    |     | 12    | 6   | 6                  | 1    | 12     | 3    | 7      |       |  |  |
| XIII              | 1    | 12                  | 1   | 12   |     | 6     |     | 6     | 5   | 6                  | 2.5  | 12     | .5   | 5      |       |  |  |
| "                 | 2    | 6                   | 5   | 6    | 9   | 7     |     | 7     | 1   | 6                  | 7    | 7      | .5   | 4      | 4     |  |  |
| "                 | 3    | 13                  |     | 13   | 5   | 6     | 4   | 6     | 3   | 6                  | 3.5  | 13     | 2.5  | 5      | 7     |  |  |
| "                 | 4    | 13                  | 4   | 13   | 4   | 5     | 11  | 5     | 3   | 5                  | 7    | 13     | 4    | 4      | 3     |  |  |
| "                 | 5    | 12                  | 10  | 12   | 9   | 6     | 11  | 6     | 4   | 6                  | 7.5  | 12     | 9.5  | 5      |       |  |  |
| XIV               | 1    | 7                   | 3   | 6    | 7   | 13    | 7   | 13    | 6   | 6                  | 11   | 13     | 6.5  | 5      |       |  |  |
| XV                | 1    | 7                   | 4   | 7    | 3   | 15    | 1   | 15    | 2   | 7                  | 3.5  | 15     | 1.5  | 4      | 3     |  |  |
| "                 | 2    | 7                   | 3   | 6    | 7   | 11    | 10  | 11    | 10  | 6                  | 11   | 11     | 10   | 4      | 9     |  |  |
| "                 | 3    | 12                  | 6   | 12   |     | 7     | 4   | 7     | 4   | 7                  | 4    | 12     | 3    | 5      | 5     |  |  |
| "                 | 4    | 16                  | 10  | 16   | 11  | 8     |     | 8     | 2   | 8                  | 1    | 16     | 10.5 | 5      | 4     |  |  |
| XVI               | 5    |                     |     |      |     |       |     |       |     | 6                  | 8    | 10     | 10   | 5      | 2     |  |  |
| "                 | 7    |                     |     |      |     |       |     |       |     | 4                  | 6    | 11     | 10   | 4      | 9     |  |  |
| "                 | 8    |                     |     |      |     |       |     |       |     | 6                  | 2    | 13     |      | 4      | 6     |  |  |
| "                 | 9    |                     |     |      |     |       |     |       |     | 6                  | 7    | 12     | 2    | 5      |       |  |  |
| General Averages  |      |                     |     |      |     |       |     |       |     | 6                  | 4.46 | 12     | 4.35 | 4      | 10.15 |  |  |
| Pueblo San Lazaro |      |                     |     |      |     |       |     |       |     |                    |      |        |      |        |       |  |  |
|                   |      |                     |     |      |     |       |     |       |     |                    |      |        |      |        |       |  |  |
|                   |      |                     |     |      |     |       |     |       |     |                    |      |        |      |        |       |  |  |
| I                 | 1    | 8                   | 3   | 8    | 3   | 6     | 10  | 6     | 9   | 6                  | 9.5  | 8      | 3    | 3      | 7     |  |  |
| "                 | 2    | 14                  | 7   | 14   | 10  | 8     | 3   | 8     | 5   | 8                  | 4    | 14     | 8.5  | 4      | 9     |  |  |
| "                 | 3    | 11                  | 3   | 11   | 3   | 8     | 3   | 7     | 6   | 7                  | 10.5 | 11     | 3    | 4      |       |  |  |
| "                 | 4    | 11                  | 6   | 12   | 2   | 7     | 1   | 7     | 10  | 7                  | 5.5  | 11     | 10   | 4      |       |  |  |
| II                | 1    | 16                  | 8   | 15   | 10  | 6     | 1   | 5     |     | 5                  | 6.5  | 16     | 3    | 3      | 9     |  |  |
| "                 | 2    | 6                   | 3   | 6    | 8   | 9     | 7   | 9     | 10  | 6                  | 5.5  | 9      | 8.5  | 3      | 2     |  |  |
| "                 | 3    | 7                   | 3   | 7    | 2   | 9     |     | 9     |     | 7                  | 2.5  | 9      |      | 5      |       |  |  |
| III               | 1    | 5                   | 7   | 5    | 3   | 12    | 10  | 13    | 2   | 5                  | 5    | 13     |      | 4      |       |  |  |
| "                 | 2    | 7                   | 11  | 8    | 4   | 11    | 8   | 10    | 11  | 8                  | 1.5  | 11     | 3.5  | 5      | 4     |  |  |
| "                 | 3    | 7                   | 4   | 7    | 8   | 7     | 1   | 7     | 10  | 7                  | 5.5  | 7      | 6    | 4      | 9     |  |  |
| "                 | 4    | 7                   | 9   | 8    | 6   | 6     | 5   | 6     | 5   | 6                  | 5    | 8      | 1.5  | 3      |       |  |  |
| IV                | 3    | 14                  |     | 13   | 10  | 8     |     | 6     | 10  | 7                  | 5    | 13     | 11   | 3      | 5     |  |  |
| VI                | 1    | 7                   | 5   | 7    | 3   | 10    | 3   | 11    | 2   | 7                  | 4    | 10     | 8.5  | 6      | 2     |  |  |
| "                 | 2    | 12                  |     | 11   | 11  | 5     | 8   | 5     | 5   | 5                  | 6.5  | 11     | 11.5 | 3      | 9     |  |  |
| VII               | 1    | 7                   | 2   | 6    | 10  | 5     | 10  | 5     | 10  | 5                  | 10   | 7      |      | 8      | 6     |  |  |
| "                 | 2    | 9                   | 8   | 10   | 1   | 5     | 9   | 6     | 4   | 6                  | .5   | 9      | 10.5 | 3      | 8     |  |  |



| Bldg.            | Room | Specific Dimensions |     |      |     |       |     |       |     | Average Dimensions |      |         |      |         |     |
|------------------|------|---------------------|-----|------|-----|-------|-----|-------|-----|--------------------|------|---------|------|---------|-----|
|                  |      | East                |     | West |     | North |     | South |     | Breadth            |      | Length  |      | Height  |     |
|                  |      | Pueblo San Lazaro   |     |      |     |       |     |       |     |                    |      |         |      |         |     |
|                  |      | ft.                 | in. | ft.  | in. | ft.   | in. | ft.   | in. | ft.                | in.  | ft.     | in.  | ft.     | in. |
| VIII             | 1    | 6                   | 3   | 6    | 2   | 12    | 7   | 12    | 7   | 6                  | 2.5  | 12      | 7    | 3       |     |
|                  | 2    | 7                   | 1   | 7    | 1   | 13    | 8   | 14    |     | 7                  | 2.5  | 13      | 10   | 3       | 9   |
| IX               | 1    | 6                   |     | 6    | 7   | 11    | 1   | 11    |     | 6                  | 3.5  | 11      | .5   | 3       | 2   |
| "                | 2    | 9                   | 10  | 9    | 6   | 7     | 3   | 7     | 3   | 7                  | 3    | 9       | 8    | 7       | 5   |
| X                | 1    | 6                   | 3   | 6    | 9   | 8     | 10  | 9     | 3   | 6                  | 6    | 9       | .5   | 3       |     |
| "                | 2    | 7                   | 6   | 7    | 5   | 11    | 10  | 11    | 9   | 7                  | 5.5  | 11      | 9.5  | 3       |     |
| "                | 3    | 7                   | 7   | 7    | 10  | 10    | 7   | 11    | 1   | 7                  | 8.5  | 10      | 10   | 3       |     |
| XI               | 1    | 13                  | 4   | 13   | 4   | 4     | 2   | 4     | 5   | 4                  | 3.5  | 13      | 4    | 2       | 5   |
| "                | 2    | 12                  |     | 11   | 7   | 5     | 10  | 6     |     | 5                  | 11   | 11      | 9.5  | 1       | 8   |
| XII              | 1    | 9                   | 9   | 9    | 10  | 8     |     | 7     |     | 7                  | 6    | 9       | 9.5  | 4       |     |
| "                | 2    | 15                  | 11  | 15   | 10  | 7     | 4   | 7     | 4   | 7                  | 4    | 15      | 10.5 | 5       | 5   |
| "                | 3    | 7                   | 10  | 7    | 8   | 10    | 6   | 10    | 3   | 7                  | 9    | 10      | 4.5  | 4       | 3   |
| "                | 4    | 7                   | 5   | 7    | 8   | 10    | 6   | 11    | 2   | 7                  | 6.5  | 10      | 10   | 4       | 4   |
| "                | 5    | 11                  | 11  | 11   | 3   | 9     |     | 8     | 9   | 8                  | 10.5 | 11      | 7    | 3       | 9   |
| "                | 6    | 10                  | 7   | 10   | 2   | 6     | 6   | 6     | 6   | 6                  | 6    | 10      | 4.5  | 4       |     |
| XIII             | 1    | 5                   | 11  | 6    | 2   | 9     | 7   | 9     | 7   | 6                  | .5   | 9       | 7    | 2       | 9   |
| "                | 2    | 6                   | 4   | 5    | 9   | 12    | 8   | 12    | 8   | 6                  | .5   | 12      | 8    | 2       | 3   |
| "                | 3    | 6                   |     | 6    | 3   | 13    |     | 13    | 8   | 6                  | 1.5  | 13      | 4    | 3       |     |
| "                | 4    | 12                  |     | 12   | 2   | 4     | 4   | 4     | 4   | 4                  | 4    | 12      | 1    | 2       | 9   |
| "                | 5    | 12                  | 3   | 12   | 2   | 6     | 6   | 6     | 9   | 6                  | 7.5  | 12      | 2.5  | 4       |     |
| XV               | 1    | 12                  | 8   | 12   | 10  | 6     | 2   | 6     | 9   | 6                  | 5.5  | 12      | 9    | 4       | 3   |
| "                | 2    | 11                  | 1   | 10   |     | 4     | 11  | 6     | 3   | 5                  | 7    | 10      | 6.5  | 4       | 4   |
| XVI              | 1    | 7                   | 9   | 7    | 10  | 13    | 8   | 13    | 8   | 7                  | 9.5  | 13      | 8    | 4       |     |
| "                | 2    | 6                   |     | 7    |     | 11    | 3   | 11    | 3   | 6                  | 6    | 11      | 3    | 3       | 4   |
| "                | 3    | 9                   |     | 9    |     | 5     | 9   | 5     | 9   | 5                  | 9    | 9       |      | 6       | 9   |
| "                | 4    | 11                  | 8   | 11   | 7   | 5     | 11  | 7     | 1   | 6                  | 6    | 11      | 7.5  | 4       |     |
| "                | 8    | 6                   | 6   | 5    | 9   | 10    | 10  | 10    | 10  | 6                  | 1.5  | 10      | 10   | 4       |     |
| XVII             | 1    | 6                   | 9   | 6    | 8   | 11    | 4   | 11    | 5   | 6                  | 8.5  | 11      | 4.5  | 2       | 7   |
| General Averages |      |                     |     |      |     |       |     |       |     | 6 8.23             |      | 11 3.82 |      | 3 11.73 |     |
| Pueblo Galisteo  |      |                     |     |      |     |       |     |       |     |                    |      |         |      |         |     |
| VIII             | 1    | 11                  | 1   | 11   | 3   | 7     |     | 7     |     | 7                  |      | 11      | 2    | 1       | 10  |
| X                | 2    | 5                   | 2   | 6    |     | 14    |     | 13    | 6   | 5                  | 7    | 13      | 9    | 2       | 3   |
| XI               | 3    | 9                   |     | 8    | 11  | 7     | 1   | 6     | 4   | 6                  | 8.5  | 8       | 11.5 | 1       | 6   |
| XII              | 4    | 6                   | 2   | 5    | 8   | 12    |     | 12    | 4   | 5                  | 11   | 12      | 2    | 1       | 9   |
| IX               | 5    | 5                   | 10  | 5    | 8   | 11    | 4   | 11    | 4   | 5                  | 9    | 11      | 4    | 2       |     |
| IV               | 6    | 11                  | 9   | 11   | 9   | 6     | 6   | 6     | 9   | 6                  | 7.5  | 11      | 9    | 4       |     |
| V                | 7    | 8                   |     | 8    |     | 7     | 10  | 7     | 10  | 7                  | 10   | 8       |      | 3       | 9   |

| Bldg.            | Room | Specific Dimensions |     |      |    |       |     |       |     | Average Dimensions |      |        |      |        |     |
|------------------|------|---------------------|-----|------|----|-------|-----|-------|-----|--------------------|------|--------|------|--------|-----|
|                  |      | East                |     | West |    | North |     | South |     | Breadth            |      | Length |      | Height |     |
|                  |      | Pueblo Galisteo     |     |      |    |       |     |       |     |                    |      |        |      |        |     |
|                  |      | ft.                 | in. | ft.  | in | ft.   | in. | ft.   | in. | ft.                | in.  | ft.    | in.  | ft.    | in. |
| V                | 8    | 10                  |     | 10   | 5  | 6     | 11  | 6     | 9   | 6                  | 10   | 10     | 2.5  | 2      | 5   |
| VI               | 9    | 7                   | 11  | 8    |    | 11    | 8   | 10    | 11  | 7                  | 11.5 | 11     | 3.5  | 2      | 6   |
| "                | 10   | 10                  | 1   | 10   | 1  | 6     | 10  | 6     | 9   | 6                  | 9.5  | 10     | 1    | 1      | 4   |
| XIII             | 11   | 4                   | 11  | 6    | 10 | 12    | 1   | 11    | 8   | 5                  | 10.5 | 11     | 10.5 | 1      | 3   |
| XIV              | 12   | 11                  | 7   | 11   | 6  | 7     | 2   | 7     | 11  | 7                  | 6.5  | 11     | 6.5  | 3      | 8   |
| XIX              | 13   | 12                  | 10  | 13   | 2  | 6     | 4   | 6     | 8   | 6                  | 6    | 13     |      | 1      | 7   |
| XVIII            | 14   | 6                   | 4   | 6    | 2  | 12    | 6   | 11    | 11  | 6                  | 3    | 12     | 2.5  | 1      | 8   |
| "                | 15   | 7                   | 2   | 6    | 4  | 14    | 2   | 13    | 6   | 6                  | 9    | 13     | 10   | 2      | 4   |
| XVII             | 16   |                     |     |      |    |       |     |       |     | 8                  | 6    | 11     | 5    | 3      | 3   |
| XX               | 17   | 7                   | 9   | 8    | 9  | 9     | 1   | 9     | 1   | 8                  | 3    | 9      | 1    | 2      | 7   |
| II               | 19   | 11                  |     | 10   | 11 | 7     | 6   | 7     | 3   | 7                  | 4.5  | 10     | 11.5 | 5      | 9   |
| I                | 20   | 9                   | 10  | 9    | 10 | 6     | 10  | 6     | 10  | 6                  | 10   | 9      | 10   | 6      | 5   |
| "                | 21   |                     |     |      |    |       |     |       |     | 7                  | 6    | 8      | 8    | 3      | 6   |
| XXI              | 22   |                     |     |      |    |       |     |       |     | 8                  |      | 11     | 8    | 2      |     |
| "                | 23   |                     |     |      |    |       |     |       |     | 9                  | 9    | 11     |      | 1      | 6   |
| XXVI             | 25   | 8                   |     | 7    |    | 10    | 4   | 9     |     | 7                  | 6    | 9      | 8    | 2      | 8   |
| General Averages |      |                     |     |      |    |       |     |       |     | 7 1.37             |      | 11 .24 |      | 2 8.17 |     |

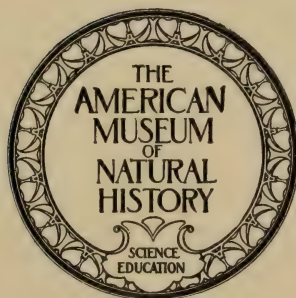
124  
ANTHROPOLOGICAL PAPERS  
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THE HORSE AND THE DOG IN HIDATSA CULTURE.

BY

GILBERT L. WILSON.



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## EDITOR'S NOTE.

During the interval 1908-1918, Doctor Gilbert L. Wilson spent from one to two months of each year among the Hidatsa Indians, collecting for the Museum and gathering information as to their culture. The accompanying pages contain only that portion of his data bearing upon, or associated with, the dog and horse culture-complexes of the tribe. In all his work Doctor Wilson has looked upon the narrative, and the demonstrations accompanying it, as true data, to be set down as they came. Further, his method was to control the narrators as little as possible, merely holding them to the description of actual personal experiences. In this way he has succeeded in recording detailed cross-sections of Hidatsa culture. Since some of these field records approach ideal completeness and are, therefore, unique as data, it was thought best to publish them in full. Attention is called to this, because otherwise the reader may find the arrangement a little confusing. Yet, if he is interested solely in special topics, as dog travois, or bull-boats, the table of contents, and ultimately, the index at the end of the volume, will pilot him to the desired paragraphs.

This paper, then, attempts to present all the narrators knew concerning the place of the dog and the horse in the culture of their tribe. It is not an abstract presentation, but a delineation of the many phases of culture closely associated with the care and use of these animals. Thus, it was inevitable that a great deal should be said about methods of camping and the order of the march, the technique of horse and dog trap-pings, etc. But it is rather for the picture these detailed narratives give of the place and function of these animals in Indian culture, that the author has chosen this form of presentation.

Another unique feature of the paper is the drawing, sketches made by Goodbird, the son of Buffalo-bird-woman, but in each case under the eye of the narrator. These also are literally reproduced by tracings, for which acknowledgment should be made to Mr. F. N. Wilson.

The importance of this study, however, lies in that over and above its factual contribution, it gives new light on culture processes. The dog came to the Hidatsa in prehistoric time, together with an elaborate culture-complex. Then, with the coming of the white man, the horse was passed on to this tribe. With the horse came a culture-complex of Old World origin, to displace the dog-complex. Just how the adjustment of the latter complex to the former was made, could be little more than guessed from the available data, but now we have in hand a large part

of the story. It is possible to go through these two complexes point by point and thus determine in just how far the horse was fitted into the old dog culture and in turn what the horse brought with him from his Old World setting. When such a study is made and the available data for other Indian tribes re-interpreted, we shall at least know the history of one set of culture-complexes. It is as a contribution to this end that the author offers these narratives.

C. W.

## PREFACE

The Hidatsa, or Gros Ventre, called Minitari by the Mandan, are a Siouan tribe speaking a dialect akin to that of the Crow. Tradition has it that the founders of the tribe, happily climbing a grapevine, emerged from the waters of Devils Lake, in what is now North Dakota, and that, migrating west, they met the Mandan at the mouth of the Heart River. It is likely that enemies forced the Hidatsa to migrate and that they were only too glad to form an alliance with the Mandan, who generously aided them to build villages near their own. How long the two tribes dwelt at the mouth of the Heart is not known. They were found there with the Arikara about 1765; in 1804, Lewis and Clark found them in the Five Villages at the mouth of the Knife River.

It is probable that the culture characteristics of the two tribes is of Mandan origin. Certainly, the traditions of both tribes agree that the Hidatsa knew nothing of corn culture until taught by the Mandan. They were apt pupils; in the sign language the sign for "Hidatsa" is a motion as of shelling corn from an ear.

Smallpox nearly exterminated the Mandan in 1837-8 and reduced the Hidatsa to about five hundred persons. The remnants of the tribes united and in 1845 moved up the Missouri and built a village of earth-lodges at Like-a-fishhook bend, close to the trading post of old Fort Berthold. They were joined by the Arikara in 1862 and neighboring lands were set apart as a reservation for the three tribes. The families began settling on allotments about 1885, and their picturesque village of earth-lodges was abandoned.

The Mandan and Hidatsa have intermarried much. By custom, children speak the language of the mother, but the dialects of both tribes are understood by nearly all. Few of either tribe have married Arikara.

With his brother, Frederick N. Wilson, an artist, the writer first visited the Hidatsa in 1906, enjoying a month's camping while his brother made sketches for a volume of myths. At Independence, they made the acquaintance of Edward Goodbird, his mother Maxidiwiac or Buffalo-bird-woman, and the latter's brother, Wolf-chief. A friendship was thus begun which the writer of this paper sincerely values.

In 1908, the writer and his brother were sent by Dr. Clark Wissler, Curator of Anthropology, American Museum of Natural History, to begin cultural studies among the Hidatsa. This work, generously supported by the Museum, was continued each year in summer vacations, until the autumn of 1918. In 1910, the writer was admitted as a student in the graduate school of the University of Minnesota, majoring in



anthropology; and during the next six years, he had the valued advice and guidance of Dr. Albert E. Jenks. The writer, then, is a student of anthropology; but it has impressed him that the published studies in this field usually present the arts and culture of primitive man as seen through civilized eyes. Is not anthropology properly a study of man himself, and is not even the material culture of primitive man chiefly valuable to us as interpreting the man himself, his philosophy, or his soul? Should we not seek to know how every art, every material complex of his culture is seen by primitive man himself, how it is proportioned in his thinking, and what superstitions and interpretations he gives to it?

Such is the aim of the accompanying paper and of others that may be published later. To the Hidatsa, the dog, for example, was an important beast of burden and his care and management was left to women. The writer has not sought the materials of his study of the dog from multiple sources and grouped and classified them in the more usual way. Rather, he has sought the viewpoint, the philosophy, of the dog's human mistress. How did Buffalo-bird-woman train and care for her dogs; how did she value them, and how use them in hunt, journey, and domestic service? How much of the dog complex came into one Hidatsa woman's life?

Circumstances favored the writer's labors. Independence, the home of his Indian friends, is an isolated point on the reservation, removed from white settlements. The writer boarded with Goodbird's family, sleeping at night on the floor of the little chapel near by. Thus admitted into their home, the writer saw the reserve of an Indian family toward a stranger yield to a helpful and sympathetic understanding of his, to them, rather strange labors; labors, which without the hearty coöperation of interpreter and informants, would have been impossible.

A few words should be said of these faithful friends. Maxídiwíac, or Buffalo-bird-woman, is a daughter of Small-ankle, an able and progressive leader of the Hidatsa in the trying time of the tribe's removal to what is now Fort Berthold Reservation. She was born about corn harvest, in the year, which by Butterfly's winter count, began in November, the Moon-of-yellow-leaves, 1840. She is conservative, holding to native beliefs and sighing for the good old times; but she realizes that the young must adopt civilized ways or perish. She speaks no English, but she has a quick intelligence and a memory that is marvelous. Her patience and loyal interest in these studies have been invaluable. On a sweltering August day she has dictated for nine hours, never flagging, though often lying prone on the cabin floor when too weary to sit longer in a chair.

Wolf-chief, her brother, was born the summer of 1849. An energetic war leader in his youth, he early saw the value of civilized culture. Though nearly thirty years of age, he attended the first school opened on the reservation, and even hired a white man to live in his cabin and teach him to read. He later opened a small trading store which he still manages. He is unable to carry on a conversation in English, but he has learned to read and write sufficiently to keep his rather simple trading accounts. He is now a Christian, of a simple, sturdy faith, respected by whites and Indians. Wolf-chief is a reliable authority in matters pertaining to men's customs and occupations, and, unlike so many of his tribesmen, does not fear to give information of native religious beliefs.

Edward Goodbird, or Tsakákasakic, the writer's interpreter, is a son of Maxídiwíac, born about November, 1869. Goodbird was one of the first of the reservation children sent to the mission school, and he is now pastor of the Congregational chapel at Independence. He speaks the Hidatsa, Mandan, Dakota, and Crow languages. He understands and reads English; that he speaks it imperfectly is an advantage, as his interpretation is close to the idiom of the informant. Goodbird is a natural student and has the rarer gift of being an artist. In his youth he was often employed to paint war records, practising what was almost a profession among the Hidatsa. His sketches, and they are many, are spirited but typically Indian. Unless otherwise stated, drawings in this paper are by Goodbird, drawn under the informant's eye and approved by him.

In the following pages the writer has sought to preserve all narratives as the informants gave them, merely arranging materials and putting Goodbird's Indian-English into proper idiom. Bits of philosophy, personal and humorous observations are as they fell from the informants' lips. The writer has sincerely endeavored to add nothing of his own.

Native Hidatsa words in this paper are written in the following alphabet.

|   |    |    |    |         |
|---|----|----|----|---------|
| a | as | a  | in | what    |
| e | "  | ai | "  | air     |
| i | "  | i  | "  | pique   |
| o | "  | o  | "  | tone    |
| ã | "  | a  | "  | father  |
| ë | "  | ey | "  | they    |
| ĩ | "  | i  | "  | machine |
| ą | "  | u  | "  | hut     |

ě as e in met

ĩ “ i “ tin

c “ sh “ in shun

x nearly like Spanish j as in pajaro

j nearly like German ch as in mich

z like z in azure

b, d, h, k, l, m, n, p, r, s, t, w, as in English

w is interchangeable with m, as is also the less used b.

n, l, and the less used r are interchangeable with d

An apostrophe (') marks a short, nearly inaudible breathing.

GILBERT L. WILSON

# CONTENTS.

|   | PAGE. |
|---|-------|
| EDITOR'S NOTE . . . . .                           | 127   |
| PREFACE . . . . .                                 | 129   |
| HORSE CULTURE . . . . .                           | 141   |
| ORIGIN . . . . .                                  | 141   |
| IDEAS CONCERNING HORSES . . . . .                 | 142   |
| THE COLT . . . . .                                | 145   |
| CASTRATION . . . . .                              | 146   |
| STALLIONS . . . . .                               | 149   |
| TRAINING . . . . .                                | 150   |
| To Swim . . . . .                                 | 151   |
| For War . . . . .                                 | 152   |
| Parading . . . . .                                | 153   |
| To Turn and Stop . . . . .                        | 153   |
| To Leap an Enemy . . . . .                        | 154   |
| SUMMER PASTURING AND HERDING . . . . .            | 155   |
| Corral under the Drying Stage . . . . .           | 156   |
| A Typical Summer Day's Herding for Boys . . . . . | 157   |
| WINTER CARE OF HORSES . . . . .                   | 172   |
| Winter Lodges and Drying Stages . . . . .         | 173   |
| Number of Horses and Lodges . . . . .             | 174   |
| Feeding Cottonwood Bark . . . . .                 | 175   |
| Feeding Dry Grass . . . . .                       | 176   |
| Feeding Hay and Bark . . . . .                    | 178   |
| Winter Pasturing . . . . .                        | 178   |
| Watering the Horses . . . . .                     | 178   |
| Small-ankle's Narrative . . . . .                 | 179   |
| Feeding Corn . . . . .                            | 180   |
| CARE OF HORSES ON THE WARPATH . . . . .           | 181   |
| PROTECTING PACK HORSES FROM MAGPIES . . . . .     | 181   |
| HORSEGEAR . . . . .                               | 182   |
| Bridles . . . . .                                 | 182   |
| Lariats . . . . .                                 | 185   |
| Hobbles . . . . .                                 | 189   |
| Saddles . . . . .                                 | 190   |
| Saddle Skins . . . . .                            | 192   |
| Carrying Tipi Poles . . . . .                     | 193   |
| The Travois . . . . .                             | 194   |
| NAMES FOR HORSES . . . . .                        | 194   |
| Our Family Herd . . . . .                         | 194   |
| Other Names . . . . .                             | 194   |
| Age Names . . . . .                               | 195   |
| DOG CULTURE . . . . .                             | 196   |
| ORIGIN . . . . .                                  | 198   |
| BUFFALO-BIRD-WOMAN'S NARRATIVE . . . . .          | 199   |



|   | PAGE. |
|---|-------|
| THE PUPPY . . . . .                               | 199   |
| CASTRATION . . . . .                              | 201   |
| FEEDING. . . . .                                  | 201   |
| KENNELS . . . . .                                 | 202   |
| THE VILLAGE DOGS . . . . .                        | 204   |
| DOGS AS PROPERTY . . . . .                        | 206   |
| GATHERING WOOD . . . . .                          | 206   |
| COLLECTING WOOD FROM THE RIVER. . . . .           | 209   |
| FETCHING FIREWOOD AND GAME BY BULL-BOAT . . . . . | 209   |
| TRAINING A DOG . . . . .                          | 211   |
| NAMES AND DESCRIPTIONS OF OUR DOGS . . . . .      | 212   |
| CHILDREN RIDE ON A DOG TRAVOIS . . . . .          | 216   |
| MAKING A DOG TRAVOIS . . . . .                    | 216   |
| DOG TRAVOIS SHELTER TENT . . . . .                | 221   |
| ADDITIONAL INFORMATION CONCERNING DOGS. . . . .   | 225   |
| Dragging Tent Poles . . . . .                     | 225   |
| Carrying Water for Dogs . . . . .                 | 225   |
| Bringing in Meat by Travois . . . . .             | 226   |
| The Leader . . . . .                              | 228   |
| Signals for Calling Dogs . . . . .                | 228   |
| Selecting Dogs . . . . .                          | 229   |
| A HUNT MADE AFOOT WITH DOGS . . . . .             | 231   |
| The Hunting Party . . . . .                       | 231   |
| Dress . . . . .                                   | 232   |
| The First Camp . . . . .                          | 235   |
| Roasting Meat . . . . .                           | 235   |
| The March . . . . .                               | 236   |
| The Second Camp . . . . .                         | 237   |
| Blood Broth . . . . .                             | 237   |
| Blood Pudding . . . . .                           | 239   |
| Ownership of Slaughtered Game . . . . .           | 240   |
| Story Telling . . . . .                           | 240   |
| Third Camp . . . . .                              | 240   |
| Fourth Camp . . . . .                             | 240   |
| Meals . . . . .                                   | 240   |
| Feeding the Dogs . . . . .                        | 241   |
| Dogs crossing a Creek . . . . .                   | 241   |
| Unloading the Dogs . . . . .                      | 241   |
| Water for Dogs . . . . .                          | 243   |
| The Tent . . . . .                                | 243   |
| Pipes . . . . .                                   | 244   |
| The Campfire . . . . .                            | 244   |
| The Beds . . . . .                                | 244   |
| Arrangement of Baggage . . . . .                  | 244   |
| The Dogs' Sleeping Place . . . . .                | 244   |
| Leaders . . . . .                                 | 245   |
| Buffalo Hunting on Deep Creek . . . . .           | 245   |
| Cuts of Meat. . . . .                             | 246   |

|  | PAGE. |
|--|-------|
| Flaying of Hides . . . . .                                   | 246   |
| The Choice Pieces . . . . .                                  | 247   |
| How the Cuts were Slung . . . . .                            | 247   |
| The Fifth Camp . . . . .                                     | 248   |
| Ferrying over the Missouri by Bull-Boat . . . . .            | 248   |
| Killing and Butchering . . . . .                             | 249   |
| Transporting Meat with Dogs . . . . .                        | 251   |
| How We Traveled with Bull-Boats . . . . .                    | 253   |
| Rescue of Awa-hitsi-kuwac . . . . .                          | 259   |
| Arrival at the Village . . . . .                             | 261   |
| A TRIBAL HUNT TO THE YELLOWSTONE IN AUTUMN . . . . .         | 263   |
| Choosing a Leader . . . . .                                  | 263   |
| Vehicles . . . . .   | 264   |
| Order of March . . . . .                                     | 264   |
| Our Camp on the Sandbar . . . . .                            | 266   |
| Turning a Tipi . . . . .                                     | 266   |
| Anchoring the Tipi . . . . .                                 | 267   |
| The Fireplace . . . . .                                      | 268   |
| The Fire . . . . .   | 268   |
| Use of the Heart Skin . . . . .                              | 269   |
| Goodbird's Birth . . . . .                                   | 269   |
| Corn Mortars. . . . .  | 270   |
| Crossing the River . . . . .                                 | 271   |
| Pack Animals and their Loads . . . . .                       | 272   |
| The First Mule . . . . .                                     | 274   |
| The Travois . . . . .  | 275   |
| The Bull-Boat . . . . .                                      | 276   |
| The Second Mule . . . . .                                    | 277   |
| The Ponies . . . . .   | 278   |
| The Eight-Pole Pony, Lashing Tent Poles . . . . .            | 278   |
| Tying up a Tipi Cover . . . . .                              | 278   |
| Other Horses, Saddle, Stirrup and Method of Riding . . . . . | 279   |
| Dogs and Packs . . . . .                                     | 281   |
| The First Dog . . . . .                                      | 281   |
| Dog Travois . . . . .  | 281   |
| Dog Travois Loads . . . . .                                  | 283   |
| Bull-Boats . . . . .   | 285   |
| How Bull-Boats were borne on the March . . . . .             | 285   |
| By Travois and Horseback with my Babe . . . . .              | 287   |
| Occupants of a Tent, Names and Relationship . . . . .        | 288   |
| The Mandan Tent Tie . . . . .                                | 289   |
| Our Tent, Construction, and Poles . . . . .                  | 291   |
| Naming Goodbird . . . . .                                    | 294   |
| Descending the Missouri in Bull-Boats . . . . .              | 294   |
| Goodbird is nearly Drowned . . . . .                         | 297   |
| WOLF-CHIEF'S HUNT WITH DOG AND TRAVOIS . . . . .             | 299   |
| Horses and their Equipment . . . . .                         | 299   |
| The Dog and Travois . . . . .                                | 299   |

|   | PAGE. |
|---|-------|
| Weapons and Ammunition . . . . .            | 299   |
| Snowblindness . . . . .                     | 300   |
| In Camp . . . . .                           | 300   |
| Setting up a Tent . . . . .                 | 300   |
| Hunting Badgers . . . . .                   | 300   |
| The Evening Meal . . . . .                  | 301   |
| Watering the Horses . . . . .               | 301   |
| Interior Arrangement in the Tent . . . . .  | 301   |
| Cooking Bones . . . . .                     | 301   |
| Mushrooms . . . . .                         | 302   |
| Treatment for Eyes . . . . .                | 302   |
| Capturing and Eating Porcupines . . . . .   | 302   |
| The Smoke Offering . . . . .                | 304   |
| The Buffalo Hunt . . . . .                  | 304   |
| Butchering . . . . .                        | 307   |
| The Tent Collapses in a Snowstorm . . . . . | 307   |
| The Return Trip . . . . .                   | 310   |
| The Feast . . . . .                         | 310   |

# ILLUSTRATIONS.

## TEXT FIGURES.

|   | PAGE. |
|---|-------|
| 1. The Hidatsa Village in 1879 . . . . .  | 143   |
| 2. A Colt tied for Castration . . . . .   | 148   |
| 3. A food-filled Heart Skin tied to the Belt with String . . . . .  | 158   |
| 4. Method of tying a Halter . . . . .   | 158   |
| 5. Carrying a Package of Maize Ears tied to the Elbow . . . . .   | 158   |
| 6. Diagram of Interior of Earth-Lodge, showing Position of Corrals . . . . .  | 160   |
| 7. A Bow and Quiver Case in one Piece, showing Method of Carrying . . . . .   | 161   |
| 8. Arrows: <i>a</i> , iron-headed; <i>b</i> , pointed wooden shafts; <i>c</i> , blunt-headed. . . . .   | 161   |
| 9. Guiding a Horse with a Halter . . . . .  | 161   |
| 10. Riding Horses . . . . .   | 161   |
| 11. A Snare set in a Gopher Hole . . . . .  | 167   |
| 12. A Stick with a Snare bound to it set in a Gopher Hole . . . . .   | 167   |
| 13. Noose tied in a Lariat for a Gopher Snare . . . . .   | 167   |
| 14. Sketch of a Gopher, with Skewer thrust through it, preparatory to<br>roasting over a Fire . . . . .   | 167   |
| 15. The Foundation for making a Bale of Grass . . . . .   | 177   |
| 16-17. Obverse and Reverse of a Bale of Grass, showing Method of Tying . . . . .  | 177   |
| 18. Goodbird's Sketch of a Horse with feathered Arrowshafts tied to Mane<br>and Tail . . . . .  | 183   |
| 19. Two Forms of the Racing Bridle . . . . .  | 184   |
| 20. Another Type of Racing Bridle . . . . .   | 184   |
| 21. A Two-Rein Bridle used on a Strong-Necked Horse . . . . .   | 184   |
| 22. Bridle used on a partially broken Pony in racing . . . . .  | 184   |
| 23. A Makeshift Bridle . . . . .  | 184   |
| 24. A Bridle used in Swimming and Towing Horses . . . . .   | 184   |
| 25. Scraping the Hair from a Piece of Green Hide preparatory to making a<br>Lariat . . . . .  | 186   |
| 26. Softening the Hide . . . . .  | 186   |
| 27. Another Stage in the Softening Process . . . . .  | 186   |
| 28. The Completed Lariat . . . . .  | 186   |
| 29. The Lariat before Trimming . . . . .  | 186   |
| 30. Rawhide Hobbles fastened with a Wooden Pin . . . . .  | 189   |
| 31. A Hobbles for Two Feet, tied only around One . . . . .  | 189   |
| 32. Looped Ends of Soft Tent Skin Hobbles through which other Hobbles are<br>passed to be carried . . . . .   | 189   |
| 33. Method of tying a Hobbles of Soft Tent Skin . . . . .   | 189   |
| 34. <i>a</i> , Pad or Racing Saddle; <i>b</i> , Flaying a Buffalo preliminary to Preparation<br>of a Saddle Skin. . . . .   | 192   |
| 35. <i>a</i> , Pack Saddle with Deer Horn Frame; <i>b</i> , Transporting a Tipi Cover and<br>Poles . . . . .  | 192   |
| 36. <i>a</i> , Holding a Puppy over the Smoke before its First Feeding; <i>b</i> , A Dog<br>Kennel; <i>c</i> , Sketch of the Frame of a Second Type of Kennel . . . . . | 203   |
| 37. Wolf-chief's Model of the Frame of a Puppy Kennel . . . . .   | 203   |
| 38. Hook for hauling in Floating Logs in the Missouri River . . . . .   | 209   |



|  | PAGE. |
|--|-------|
| 39. Sketch showing how Long Sticks of Wood were carried by Women . . . . .                                 | 209   |
| 40. A Bull-Boat loaded with Wood being paddled across the Missouri . . . . .                               | 210   |
| 41. Reviving an Unconscious Dog . . . . .  | 210   |
| 42. A Bob-Tailed Dog . . . . .   | 210   |
| 43. Goodbird's Sketch of a Dog . . . . .   | 210   |
| 44. The Dogs run off to fight while Goodbird rides on the Travois . . . . .                                | 215   |
| 45. Travois Poles, showing Manner of Attaching and Tying . . . . .   | 215   |
| 46. Measuring the Pole which is to form the Rim of the Travois Basket . . . . .                            | 217   |
| 47. Looped Bundle of Rawhide Thong prepared for Netting Travois Basket . . . . .                           | 217   |
| 48. Rim of the Travois Basket held in Shape for drying, by a Rawhide Thong . . . . .                       | 217   |
| 49. The Completed Travois Basket . . . . .   | 217   |
| 50. The Tie for securing the Load to the Travois Basket . . . . .  | 217   |
| 51. Frame for Shelter made by setting up Three Dog Travois and adding<br>Several Extra Poles . . . . .     | 222   |
| 52. The Shelter with Flaps closed for the Night . . . . .  | 222   |
| 53. The Shelter with Flaps raised to allow Circulation of Air . . . . .                                    | 222   |
| 54. Rear of Shelter Tent with Excess of Cover weighted down with a Stone . . . . .                         | 222   |
| 55. Interior Sleeping Arrangements in Travois Shelter Tent . . . . .                                       | 223   |
| 56. Diagrammatic Sketch showing Dog dragging Tent Poles lashed to the<br>Fork of the Travois . . . . .     | 226   |
| 57. Three Travois set up to form a Tent Frame . . . . .  | 226   |
| 58. A Buffalo Paunch filled with Water, tied with a Buckskin Thong, and<br>skewered with a Stick . . . . . | 226   |
| 59. Diagram to show how a Bull-Boat was lashed to a Dog Travois . . . . .                                  | 231   |
| 60. Dog carrying a Bull-Boat as a Travois Load . . . . .   | 231   |
| 61. Type of Unornamented Moccasin worn on the Hunt in Winter . . . . .                                     | 233   |
| 62. Moccasin Pattern . . . . .   | 233   |
| 63. Coat worn by Son-of-a-star during the Hunt Afoot . . . . .   | 233   |
| 64. A Rocky Mountain Sheepskin Dress decorated with Elkteeth . . . . .                                     | 233   |
| 65. Sketch of a Buffalo Robe to show Notches cut out at Shoulder to make it<br>more Symmetrical . . . . .  | 234   |
| 66. Front and Rear Views to show Proper Method of Wearing a Buffalo Robe . . . . .                         | 234   |
| 67. How Meat was carried into Camp on the Hunter's Back . . . . .  | 236   |
| 68. Moving Camp: the Order of March . . . . .  | 236   |
| 69. Sketch of Exposed Buffalo Breast to show where Blood for Broth was<br>obtained . . . . .               | 238   |
| 70. Sketch of a Buffalo Paunch . . . . .   | 238   |
| 71. Bag made from part of Paunch and filled with Blood . . . . .   | 238   |
| 72. Sketch of Buffalo Intestines . . . . .   | 238   |
| 73. Assisting a Dog to swim a Creek . . . . .  | 241   |
| 74. Travois stacked for the Night . . . . .  | 242   |
| 75. Construction of Bed used in Tent on the Hunt . . . . .   | 242   |
| 76. The Skin Tent . . . . .  | 242   |
| 77. Position of the Beds within the Tent . . . . .   | 242   |
| 78. The Meat Drying Stage . . . . .  | 245   |
| 79. A Green Hide temporarily folded before Fleshing . . . . .  | 247   |
| 80. Method of Fastening Meat to Thong of Green Hide for Transportation . . . . .                           | 247   |
| 81. How the Tie shown in Fig. 80 is made . . . . .   | 247   |

|  | PAGE. |
|--|-------|
| 82. Two Pieces of Meat tied together for Transportation . . . . .  | 247   |
| 83. The Meat Pile and its Contents . . . . .   | 250   |
| 84. Buffalo-bird-woman and her Husband paddling one Bull-Boat and towing<br>another loaded with Meat and Skins . . . . .           | 254   |
| 85. Wading into the River to Load a Bull-Boat . . . . .  | 254   |
| 86. Bull-Boat Paddles decorated with Honor Marks . . . . .   | 257   |
| 87. Sketch Map of Camp on a Sandbar where Goodbird was born . . . .  | 265   |
| 88. Method of driving Stakes into the Ground to hold the Anchor Rope of a<br>Tipi . . . . .  | 267   |
| 89. Roasting Buffalo Thigh Bones before the Tipi Fire . . . . .  | 267   |
| 90. Making Fire with a Wooden Drill . . . . .  | 267   |
| 91. <i>a</i> , Goodbird's Wrapping, as a Baby, on the March; <i>b</i> , the Tie for the<br>Thong Binding the Baby Bundle . . . . . | 267   |
| 92. Construction of a Buffalo Skin Corn Mortar . . . . .   | 271   |
| 93. How a Pestle was carried on a Dog Travois . . . . .  | 271   |
| 94. Removing the Hair from a Buffalo Hide to make a Corn Mortar . . .  | 271   |
| 95. Construction and Tie for a Buffalo Skin Bag . . . . .  | 271   |
| 96. Construction of a Double Bag used for Shelled Corn . . . . .   | 273   |
| 97. Making a Buffalo Calfskin Bag: A, B, skinning; C, inflating; D, drying;<br>E, the completed bag . . . . .                      | 273   |
| 98. Travois, with Bull-Boat, Hoe, and Ax tied to It . . . . .  | 275   |
| 99. Diagram of Horse Travois . . . . .   | 275   |
| 100. Travois Thong Tie . . . . .   | 275   |
| 101. Travois Thong Tie as made when Speed was desired . . . . .  | 275   |
| 102. Method of lashing Bull-Boat to a Horse Travois . . . . .  | 277   |
| 103. Form of Old Type of Bull-Boat . . . . .   | 277   |
| 104. A Saddle with Two Double Bags filled with Provisions hung on It . .   | 277   |
| 105. Arrangement of Bags and Tent Poles for Transportation . . . . .   | 277   |
| 106. Methods of folding a Tent Cover in Preparation for loading . . . .  | 279   |
| 107. A Tent Cover tied ready for Loading . . . . .   | 279   |
| 108. Method of Loading and Tying Tent Cover on a Horse . . . . .   | 280   |
| 109. Sketch of Horse and Two Riders to show Robe tied over Legs of Two<br>Boys in Winter . . . . .                                 | 280   |
| 110. Sketch of Horse and Two Riders to show Position of Riders in Summer .   | 280   |
| 111. A Dog Travois . . . . .   | 282   |
| 112. Cross-section of Construction of Pad on Dog Travois . . . . .   | 282   |
| 113. Position of Straps, Breast Band, etc., when Travois is not in Use . .   | 282   |
| 114. Buffalo Shoulder Bone used in Skin Dressing . . . . .   | 283   |
| 115. The Hidatsa Dog . . . . .   | 286   |
| 116. Travois Harness properly adjusted on a Dog . . . . .  | 286   |
| 117. Diagram of a Bull-Boat lying Mouth down over the Travois Pole . .   | 286   |
| 118. Method of fastening a Bull-Boat to a Horse Travois . . . . .  | 286   |
| 119. Buffalo-bird-woman riding on a Travois . . . . .  | 287   |
| 120. Buffalo-bird-woman riding a Horse with her Baby tucked inside her<br>Belted Robe . . . . .                                    | 287   |
| 121. The Mandan Tipi . . . . .   | 290   |
| 122. Groundplan of Tent used on Tribal Hunt . . . . .  | 290   |

|  | PAGE. |
|--|-------|
| 123. Diagram showing Method of bunching Bull-Boats to prevent their over-<br>turning in a Strong Current . . . . . | 296   |
| 124. Diagram showing the Order of Bull-Boats as they floated down the<br>Missouri . . . . .                        | 296   |
| 125. Flies-low in a Bull-Boat holding the Infant Goodbird in a Storm . . .   | 298   |
| 126. The Tent used during Wolf-chief's Hunt . . . . .  | 300   |
| 127. An Improvised Cap worn as Protection against Snow . . . . .   | 309   |

## HORSE CULTURE.

(Narrative of Wolf-chief)

Wolf-chief, an Hidatsa full-blood, was born about 1849. Consequently, his experience with horses would date from about 1860. The following information was given by him in August, 1913, and supplemented in August, 1918.

### ORIGIN.

I know no tradition, or story, telling how we Hidatsa first got horses. Since all our old stories tell only of dogs being used as beasts of burden, I think we must have gotten our first horses rather recently. In the old tales my father used to tell me about our tribe, he always spoke of the use of dogs in transporting the household goods, whenever the Hidatsa went to hunt in the Bad Lands, or moved to the winter village. He never mentioned the use of horses.

One of these stories told of a buffalo hunt up the Little Missouri River, at the time the Hidatsa lived at Five Villages, at the mouth of the Knife River. On this hunt they killed a great many buffalo, dried the meat, and brought it home on travois dragged by dogs. "Had we no horses then?" I asked my father. "I never heard that we had," he answered.

So far as I know, the Mandan also had no horses until about a hundred years ago.<sup>1</sup> There is a tale of a hunt made by the Mandan when they lived near Bird-beak Hill, which bears out this statement. They hunted toward the south where they found a large herd of buffalo, and this they surrounded, both men and women. They held the windward side of the circle open until all the buffalo were within, and then closed it. Then the hunters went inside the circle and shot the buffaloes with arrows. The meat was carried home by dogs. If they had had horses at the time, they would not have surrounded the buffalo herd in this way and would not have brought all the meat home on dogs.

Another time, I have heard, the Mandan hunted to the north. They killed some buffaloes, but there was no timber near by from which to build drying stages. The women cut the meat into long, thin sheets, not

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<sup>1</sup>The only positive early historical data that have come to our notice for horses among the Village tribes are certain statements of La Verendrye and his sons. They seem to have first visited these villages in 1738, but make no mention of horses there, stating, however, that the tribes living to the immediate south had horses. Yet, in 1741 they seem to have found horses in possession of the Village tribes. Later, J. McDonnell (1793) reports that all the villages were using horses. See this series, vol. 17, part 1, and the *American Anthropologist*, N. S., vol. 16, 1-25.

The zoology of the Indian horse has not been studied, nor do we find good technical descriptions in the early literature. The best early drawings of horses are by Bodmer, who accompanied Maximilian in 1833-1834, but even these seem conventional.

The Editor is responsible for all unsigned footnotes in this paper.



unlike blankets. These were thrown around the bare shoulders and back of the son-in-law of the family and he stood in the sun all day to dry the meat. As his back was turned to the sun, his breast and thighs were in the shade, so the sinews from the buffalo's back were tied about him to hang from his thighs and across his chest. In this way the meat and sinews were dried by evening. The dried meat was carried home on the backs of the men and women in bundles about two feet thick by three feet long. This also seems to be proof that the Mandan did not have horses; if they had had them, they would have brought the meat home on the horses' backs.

My father also told me this story:—

Two birds were once transformed into men. They were born as babes in a Hidatsa village and grew up there. One was named Máhai'tíac, or Big-spring, and the other, Tsakáka-i'tíac, or Big-bird. As the two men, although in human form, were really birds, they had great supernatural power.

Once the two bird men went with a war party to the south with some Assiniboin, who were then our friends. They came to some enemies. One of the Assiniboin also possessed great mystery power and he and the two bird men worked against these enemies. They fought those enemies, who were in a big village, and killed many. Those who were not slain sprang into the Missouri River. The three mystery men returned victorious with the rest of the party. It was about the time of this incident, I think, that the Hidatsa obtained their first pony. I think they got it from the western Cheyenne, whom we called the 'Spotted Arrow Feathers.'

My father also told me that the Assiniboin and some other tribes considered their horses sacred, praying to them and singing sacred horse songs to them. Since we Hidatsa did not follow these Assiniboin customs, he was of the opinion that our horses must have come from some other tribe. Had we obtained them from the Assiniboin, we too would have considered them sacred and sung sacred horse songs to them as they did.

Our winter counts do not tell us when we first obtained horses; but I think it was not quite three hundred years ago. After we got, as I believe, the first Cheyenne pony, our horses increased and many came to be owned in our tribe.

#### IDEAS CONCERNING HORSES.

When I was somewhat past ten years of age, my father took me with him to watch the horses out on the prairie. We watered the herd and about the middle of the day came home for dinner. In the afternoon we again took the herd out to graze. There were many enemies around at the time and we had to guard our horses closely.

While we sat watching the herd my father said: "These horses are gods, or mystery beings. They have supernatural power. If one cares



Fig. 1. The Hidatsa Village in 1879.





for them properly and seeks good grazing and water for them, they will increase rapidly. I am sure, my son, that if you will remember my words and observe them when you are older, your horses will increase and all will know that you are a good raiser of horses. Other tribes also observe these things, and are known to be good raisers of horses.

I have said that these horses are gods; for they have minds and understand. I once had a stallion and did not guard him as I should, so he wandered away to another herd of horses. Even then I did not go to get him, but let him go as if I did not care. One night I dreamed that the stallion stood before me. 'You did not care for me as you should have done,' he said. 'You would not give me good water and grass, so I went to another country to look for mares.' Not long after that, some enemies came and stole that stallion from me. So the dream came true. He went to another country and I lost him. Ever since that time I have taken good care of my horses."

#### THE COLT.

In preparation for the birth of a colt, a pint or two of dried dung of antelope, elk, or jack-rabbit was gathered and kept in readiness to rub over the colt's body as soon as it was born. This was to absorb the gummy moisture with which the colt's body was covered at birth and to dry its coat. The dung of jack-rabbit, antelope, or elk was used because these are all speedy animals, and so would cause the colt to grow up to be speedy like them, valuable for racing and hunting.

When a colt is born, the mare should bite off the umbilical from the afterbirth. Goodbird says he knew a mare that bit the umbilical too close, and her colt died. The dung was always rubbed over the colt after the umbilical had been bitten off. Then the owner of the colt broke off the soft yellow pads from the bottoms of the colt's hoofs; with his thumb and forefinger he pressed the soft, inside part of the hoof along the edge to make it symmetrical and even.

Although I myself have never seen it done, I have heard that in the old days, when the birth of a colt was expected, everyone went off and left the mare to herself, as it was said that the birth was thus made easier. After the colt was born, the owner led the mare and her colt outside the village and picketed her there. For the first ten days the colt was carefully guarded lest it be attacked by wolves, or be injured by the other horses; after that, it was turned out with the herd. I have heard of colts being born within the earth-lodge, but I never witnessed this myself. My father told me that a colt was once born in his earth-lodge,



but I never heard of this happening elsewhere in the village, at least in my lifetime.

The boys of the household had a strange use for the first dung dropped by a colt. It made an excellent yellow arrow paint. We boys rubbed it on our arrowshafts, or sometimes took it home and rubbed it on our play sticks, for the game of *úmakihěkě*. This quality of the colt's dung continued for the first two or three times a colt dunged. As I recollect it, we picked the dung up in the morning and evening. It was a small, gummy mass, about the size of one's thumb. We used it wet; or if it was dry, we spat on it and rubbed the moistened part on the arrowshaft.

### CASTRATION.<sup>1</sup>

A stallion colt born in May was sometimes castrated the next fall, or when about five months old; but generally castration was postponed until the colt was two years old. It might take place even later, as five, six, or seven years after birth. Two years, however, was the more usual age for castrating horses.

Certain men who knew the art were called in to perform the castration for a castrator must first have bought the art from someone who owned it. A castrator's fee consisted of ten objects; three of these were essential, while the rest might be chosen by the owner of the colt. The three essential objects, a knife, a rawhide rope, and the tanned skin from a buffalo's belly worked with porcupine quills or painted with white clay, were symbolic of the castrator's calling. The tanned buffalo skin was

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<sup>1</sup>Castration naturally raises the question as to European influence. It can be assumed that the idea and the technique were taken over from the European colonists along with many other aspects of horse culture. Yet, the castration of dogs is reported as a fixed custom among the Northern Plains tribes, as if it were aboriginal. Maximilian (*Travels in the Interior of North America*, Vol. 2, 175) is responsible for the statement that buffalo calves were castrated and turned loose so as to provide superior meat animals. If this be correct, then the weight of evidence for the prehistoric existence of the technique is increased. However, as the case stands, we cannot be sure that the idea of castration did not come in with the horse and then, by suggestion, was applied to dogs. The probabilities, at least, favor the European origin of the idea.

On the other hand, it appears in the Plains early, since in the time of Lewis and Clark the custom seems to have been known to all the Indians, for when among the Chopunnish we read: "we have found our stonehorses [stallions] so troublesome that we indeavoured to exchange them with the Chopunnish for mears or geldings but they will not excha[n]ge altho' we offer 2 for one, we came to a resolution to castrate them and began the operation this evening one of the indians present offered his services on this occasion. he cut them without tying the string of the stone as is usual, and assures us that they will do much better in that way; he takes care to scrape the string very clean and to separate it from all the adhering veigns before he cuts it. we shall have an opportunity of judging whether this is a method preferable to that commonly practiced as Drewyer has gelded two in the usual way." (35).

"... several of the horses which were gelded yesterday are much swollen particularly those cut by Drewyer, the others bled most but appear much better today than the others." (39.)

"... our horses are all recovering & I have no hesitation in declaring that I believe that the Indian method of guldling [is] preferable to that practised by ourselves." (103) (See *Original Journals of the Lewis and Clark Expedition*, vol. 5, New York, 1905.)

While these are the only cases of castration we have noted, it is plain from the text that geldings were obtained from the Indians on the Missouri. Turning now to the technique of the operation, it appears that the Chopunnish Indian referred to above, did not follow the precise method described by our informant.

used as a saddle blanket; the rawhide rope was to lead the horse; and the knife was employed in the operation.

The castrator always kept on hand sinews from the back of a jack-rabbit, an antelope, or an elk, which he used for making the necessary ties. We believed that according to the sinews used to tie the wounds of the castrated horse, so would he afterwards exhibit the peculiarities of speed of the animal furnishing the sinews. Thus, the jack-rabbit runs with great speed, but stops every now and then; the antelope runs rapidly but soon becomes winded; the elk has both speed and endurance.

In old times I knew a man named Big-black-spot, who castrated horses. I will tell you how I saw him castrate a colt of mine. I had two colts, about two years old, which I wanted to become race horses. I tried them both, and found that one showed very good speed and bottom. I asked my father's opinion. "The second colt," he said, "will make a speedy horse, but he should be castrated to make him faster."

There was another reason why I thought the colt should be castrated. In the spring, when the snow is soft and the ground muddy and slippery, horses, especially stallions, tire very quickly. A stallion, no matter what his condition, whether plump or lean of flesh, was apt to give out soon and show weariness. A castrated horse did not tire so easily.

I sought out Big-black-spot in his lodge. "I want you to castrate one of my horses," I told him. He agreed. "I did so to a stallion for another man a little while ago, and I still have some of the necessary materials," he said. "What do you ask for pay?" I asked him. "I must ask for a knife, a tanned buffalo-belly skin, and a rawhide rope," he answered. "I also expect seven other articles as you may choose to give me." "I have them all ready, now," I said. "Then let us take the colt out of the village," said Big-black-spot.

He got his materials and we led the colt out of the village. A friend of mine, Lean-bull, helped. We put a rope over the colt's neck and drew it around his hind legs. A second rope was fastened about his forelegs, and the colt was thrown.

Big-black-spot drove a stake into the ground with an ax, and bound the colt's forelegs and one hind leg to it. The left hind leg was fastened to the rope around the colt's neck, Fig. 2. Around the colt's scrotum, above the testicles, was firmly tied a bowstring, the free end of which was carried back and attached to the tail. This was to prevent the colt from drawing up his testicles. Then Big-black-spot anointed the colt's scrotum and adjacent parts with some medicine he had brought with him in a pan, saying, as he did so, "Let this make your body good and

strong." This medicine we called *atúdědě*. It is a bulbous root from the Rocky Mountains, not unlike a prairie turnip, but larger. It was scraped fine and powdered and mixed with water. Before applying the ointment it was warmed over a fire built near by. After using the ointment, Big-black-spot rubbed the same parts with wild sage.

Big-black-spot now showed me three kinds of sinew; the shortest piece, about seven inches long, was from a jack-rabbit; the second, fifteen inches long, and white, from an antelope; the third, two and a half feet



Fig. 2. A Colt tied for Castration.

long, from an elk. They were all taken from the back of the animal, like the sinew we take from an ox. Big-black-spot asked me to choose which sinew I wanted for tying. "If I use the jack-rabbit sinew," he said, "your horse will run as swiftly as a jack-rabbit, but will stop when you are not expecting it; if I use antelope sinew, your horse will run swiftly, but will not be able to keep his pace for a long time; if I use elk sinew, your horse will not run as rapidly, but will have more strength and endurance." I chose the elk sinew.

Big-black-spot picked up the sinew and his knife and proceeded. He made a horizontal incision quite around the middle of the scrotum; he removed the outer skin of the lower half of the scrotum and cast it off. This exposed the two testicle sacks. He cut the tendon, or muscle, that united the two testicle sacks and made a vertical incision in each sack, on one side only; he now drew the testicle through this incision, letting the empty testicle sack slip up under the upper half of the scrotum. He pushed the stump of the scrotum well up, drew down the two testicles, and after tying the elk sinew tightly about the tissues from which each testicle hung, he cut off both testicles with his knife. The elk sinew he used had been prepared and twisted like a bowstring.



Big-black-spot now dipped his bunch of wild sage into the medicine again and brushed the parts about the wound saying, "I want you to make your body good so that your wound will heal quickly. I want you to grow and spring up like these plants. I hope Wolf-chief will have good luck with this horse this year."

Big-black-spot untied the colt and he got up. He faced the colt west, and threw the severed testicles in the same direction, and said, "Lead your horse in a short circle around these testicles, and return to the place where the horse is now standing." I did so, moving in a sunwise circle. Big-black-spot then continued: "Take these severed testicles and throw them into the Missouri River. Water your horse at the river this evening and again in the morning; but watch him carefully for four days, and do not let him enter the water, where he will sink up to his wound. After the fourth night (i.e., day) let him enter the water so that any corrupt matter may be washed away. After the fourth night, also, you may turn him loose to graze; after ten nights, you may ride him a little; after fifteen nights, the horse will be well again, and you may let him run as he wills."

He castrated the colt in May. The operation took about two hours, from nine in the morning until eleven. I paid Big-black-spot moccasins, calico, a dish, and other things, besides the three essential articles for his work. The first four days after he was castrated, I let the colt run loose outside the village, but watched him constantly. When he recovered from his wound, I rode him as Big-black-spot said. I rode him in a race and he went very fast. In the autumn I rode him in battle and pursued the enemy, riding up close to them. They shot at me, and my horse was shot through the lungs and killed. Thus it seems, the prayers of Big-black-spot were not strong.

#### STALLIONS.

The best stallion was kept for breeding. Stallions were not all alike; some gave more attention to mares than others. This we thought a sign of vigor. Then, too, we observed that some stallions produced no colts.

My grandfather, Big-cloud, had a fine stallion named Amanú'kac, or Digs-out-dirt, because he always pawed up the dirt with his hoofs when he came to a herd. He was often threatening to the boy herders, putting his ears far back on his head and looking savage, but he never really bit or harmed them. He was a good stallion, forcing his attentions, in spite of avoidance and kicks. He raised blue colts.

This stallion visited other herds, but Big-cloud never charged anything for his use, since it was not customary. When one owned no stal-



lion, he simply asked permission of the owner of a good stallion, to drive the latter into his herd. I do not think a man owning a stallion ever borrowed one from another.

Stallions that grew to be two years old and were slow and lazy, were castrated; also those from which no colts were born. After he was eight or ten years old, a stallion would lose his vigor; he was then castrated. Such a castrated horse was strong and good for hunting or riding any time of the year. Mares bred to stallions in the spring. A stallion stopped breeding about the first of August. Some colts were born in May, some in June, and a few in July. Gestation lasted one year.

When a mare was bred to a stallion we could not predict what color the colt would be. Sometimes the colt followed the color of the stallion, sometimes of the mare.

Usually a mare bred to a stallion about the last of April or in May. The mares were allowed to run with the herd. In our family herd were three mares and one stallion. During the breeding season we let the stallion run for a week or two with the rest of the herd. Nearly every man who owned horses kept a stallion.

After a mare was bred to a stallion and she was seen to be gravid, her owner was careful, when riding her, to sit well forward; and he was especially careful to see that she was never ridden double. A mare ridden double, or with the rider seated too far back, would be likely to cast her colt before its time. For the same reason, a gravid mare was never struck on the back with a whip. An unborn colt lies with its head close to the mare's backbone, and there was danger of the whip striking the head and injuring it.

If a gravid mare developed an irritable disposition, trying to bite the other horses, we said, "That mare carries a stallion colt." But if the mare continued gentle, we thought it a sign that she carried a mare colt. If a gravid mare was afraid to go on slippery places and hesitated to go on ice, we thought it a sign that her colt would be a mare; but if she was bold, fearing neither ice nor slippery ground, we thought she would bear a stallion colt.

A mare bred in May should bear a colt the next May.

#### TRAINING.

A colt was broken at two years of age, for a three-year-old is nearly grown, and is then hard to break. Yearlings were sometimes broken, but were apt to develop lameness, or grew knock-kneed from the weight of the boys riding them. The joints of a yearling's legs are still soft.

Colts were broken by boys fourteen to seventeen years of age; but boys as young as eleven helped. As I have often broken colts, I will tell my own experience.

Several of us drove a herd down by the Missouri at a place where the current was rather swift, and so likely to prevent a swimming colt from getting back to shore too easily. I roped a two-year-old and drove him into deep water; swimming out to the colt, I mounted him and made him swim with me on his back. Now a two-year-old still suckles his mare, and frightened at my weight, the colt tried to make shore, where he knew his mare was. I clung to his back, forcing him to swim until, reaching shallow water, his feet touched ground, when he soon struggled to land. By this time I had dismounted. Following the colt, I drove him again into deep water and repeated the lesson; and so for two or three hours, until the colt was weary. The last time the colt came out, I stayed on his back.

Only one boy mounted a swimming colt, for under the weight of two a colt would sink. A horse drowns more easily than a man. "If a horse sinks until water runs into his ears, he grows weak," we Indians say.

As the colt reached shore the last time, another boy mounted behind me; and together we rode the poor beast back and forth over the low-lying sandbank covered with soft mud. There are many such sandbanks along the Missouri; a slight rise in the river covers them with several inches of soft mud. We rode the colt over such ground until it was utterly exhausted.

Had we tried to mount him when he was fresh, the colt would have bucked and very likely given us a fall. However, in the soft mud or in the sand we were not likely to be hurt even if we were thrown off; certainly, a fall here would not be as dangerous as on hard ground. It was usual for two boys to ride the colt we were breaking, as the animal was thus more rapidly exhausted. We always rode bareback when breaking a colt.

We continued these two or three-hour lessons for three successive days, after which we considered the colt broken; it was now usually safe to mount and ride him on land.

*To Swim.* A colt was also taught to swim the Missouri. To train my colt, I needed the help of two other boys. One of these swam ahead with a lariat, one end of which was bound about the colt's head like a halter (to have fastened the lariat like a bridle about the colt's lower jaw would have been dangerous, as likely to have let water run down his throat). I followed, swimming on the downstream side of the colt, guiding him, and clinging with one hand to his mane. A third boy swam

at the colt's tail, but not grasping it; now and then he scratched the colt's ham or leg to frighten him and make him swim ahead, or struck the colt on the back above the tail crying, "*yíh-hah!*"

The water covers a swimming horse only a few inches and his back is visible from above. The horse works his legs as in walking and breathes through his nostrils, with a prolonged snorting sound, made by blowing water from them.

There was need to train our ponies to take the river readily. One might be out with a war party fleeing from enemies. In such times he needed a pony trained to swim for he might have to escape across the Missouri. Then, too, we needed well-trained ponies to pursue our enemies. We were much troubled by our foes when I was a boy, especially by the southern Sioux. Our village stood on the north bank of the Missouri at Like-a-fishhook bend. The river here was rather narrow and in summer parties of Sioux sometimes approached the south side of the river, and running out on a sand bank there, shot across into the village. More often they hid in the woods that skirted the river, especially at early morn or evening, waiting for some woman or child to come down to the watering place, or to bathe. The Sioux would then rush out from their hiding place and shoot across at the bather.

The sight of enemies on the other side of the Missouri was always a signal for our brave young men to seize their horses, gallop to the river, and plunge in and swim across in pursuit; but unless a pony had been trained to it, he was likely to refuse to breast the swift current. With their well-trained ponies our young men were able to cross quickly.

*For War.* I did not begin to train ponies for war until I was sixteen years old. A boy of fourteen we thought old enough to strike an enemy; and some boys at this age began to train and manage war ponies. A boy as young as eleven might help break colts, but his legs were not strong enough for him to keep his seat on an untrained pony. A sixteen year old boy should be stout of legs and able to stick on a pony's back and manage and train him for war.

A war pony was trained to dance, as we called it. I took my previously broken two-year-old, mounted, and kicking him with my heels and drawing in my breath with a whistling sound through nearly closed lips, signaled him to go; but while doing thus, I also drew on my reins, jerking them repeatedly, as if to stop my pony. Not liking this, he tried to break away, but I checked him each time with the reins, and even struck him, not very severely, on breast and fore legs, with my quirt. All this made the colt leap and prance about from side to side, his fore legs moving together, but his hind legs moving alternately.



Again, drawing my breath with whistling sound and kicking my colt with my heels, I now and then drew on my reins steadily, but not jerking them. This made the colt rear straight up on his hind legs. Sometimes a rider, making his pony rear thus, slid down his horse's back, unable to keep his seat.

I gave my colt several such lessons, in the morning and again in the evening. After two days, the pony had learned what was wanted of him.

Every war pony was taught to dance. In battle, unless a pony was constantly moving, he drew the enemy's fire upon horse and rider alike. A standing pony made an easy mark. A pony trained to dance and prance was much less likely to be shot.

*Parading.* On quiet evenings in summer, a young man painted and dressed in his best, often mounted his trained pony and paraded through the village, making the pony dance as he went. Usually just one young man paraded, not several in a company; his purpose was to be admired by the village maidens. He wanted them to see what a fine figure he cut on his war pony. Or, sometimes a brave warrior, one esteemed by every one and who had won honor marks, would parade on his pony. The warrior did so without weapons.

Sometimes, when parading, the rider halted his pony and thrust the toe of one foot under the fore leg of his steed between its leg and body; at the signal, the pony lifted his leg and pawed the ground. The rider then did likewise with his other foot, making the pony paw with his other fore leg. This the pony had also been taught when he was trained to dance.

*To Turn and Stop.* A war or hunting pony should be trained to turn at the shifting of his rider's weight to either side.<sup>1</sup> Thus, I mounted my pony, and urging him at full speed, fell over on his right side, throwing my left leg over his back and holding to his mane with my left hand, or throwing my left arm over his neck. At the same time I pulled on his right rein, causing the pony to turn to the right in the arc of a circle. Or, if I dropped on the left side, I threw my right leg over the pony's back. Thus exercised, he learned to turn always toward the side on which he felt the weight of my body.

In time, a pony came to obey the movement of his rider's body very readily, quite without the use of the reins, whether ridden saddled or bareback. This training was of great use in hunting and war. We hunted buffaloes with bows and arrows when I was young; powder was costly

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<sup>1</sup>For training of horses to run buffalo, see Boller, Henry A., *Among the Indians. Eight Years in the Far West; 1858-1866. Embracing Sketches of Montana and Salt Lake* (Philadelphia, 1868), 233-235.



and was saved for war. A hunter, unless left-handed, overtaking a buffalo, approached from the right of the animal. Running then on the right, and a little back of the buffalo, the hunter leaned over to the left with bow ready and arrow on string. A well trained pony, feeling the weight of his rider's body on his left, turned in close to the buffalo, thus giving the hunter a good shot; and being thus trained, the pony did not shy off or show fear, as he otherwise would, at approaching the buffalo.<sup>1</sup>

Likewise, if in battle I approached the enemy and they began to shoot at me, I could drop, let us say, on the right side of my pony, clinging, as explained, with my left leg over his back. Feeling my shifting weight, the pony would swerve around toward the right, exposing his left side to the enemy and shielding my body with his own; and in like manner, if I dropped on his left side, the pony would swerve toward the left. I once saved my life thus shielding my body behind my pony; he was killed, but I escaped unhurt.

We also trained our ponies to stop short, even if going at high speed.<sup>2</sup> For this purpose I laid a blanket or other object on the ground, galloped up to it, and drawing sharply on the reins brought my colt to a full stop. A pony was usually intelligent and soon learned to stop short, even when going at full speed; but a rider had to look sharp that he be not thrown from his horse's back.

Such training was very necessary, for in places like the Bad Lands one might come unexpectedly upon chasm or ravine, and must stop abruptly or risk a bad fall. A pony's natural bent was to try to leap a chasm even if the distance was an impossible one.

*To Leap an Enemy.* Another thing a war pony, indeed almost every horse, was taught to do, was to leap an enemy. I made a small pile of sunflower stalks or cornstalks, or brush, or almost anything, and covered the pile with a blanket, usually the blue cloth kind we wore. I mounted my colt and made him gallop up to the blanket and leap over it. At first he would be afraid and would try to go around the pile; but at last he leapt over the blanket. A day's lessons were enough to break a pony to do this.

Let us suppose I was in battle and an enemy fell. If near, I would try to ride up and strike coup on the body. But unless my pony were

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<sup>1</sup>Peter Pond, 1740-1745, reported that the Yankton-Dakota had numerous horses:—

"They Have a Grate Number of Horses and Dogs which Carres there Bageag when they Move from Plase to Plase. . . They Run down the Buffelow with thare Horses and Kill as Much Meat as they Please. In Order to have thare Horseis Long Winded they Slit thair Noses up to the Grissel of thare head which Make them Breath Veray freely. I Have Sean them Run with those of Natrall Nostrals and Cum in Apearantley Not the Least Out of Breath." (*Collections of the State Historical Society of Wisconsin*, vol. 18, 353).

<sup>2</sup>For skill in handling horses, see Boller, *ibid.*, 64.

trained, he would be almost sure to swerve. A trained pony leaped over the fallen enemy, giving me opportunity to strike coup.

Even if a warrior did not actually strike his fallen foe, if he made his pony vault over the body, it counted a coup, first, second, third or fourth, exactly as if the coup were made by striking with a hand weapon.

#### SUMMER PASTURING AND HERDING.

Horses were driven to pasture in summer, usually about three miles from the village. Every family herd had its herder, usually a boy; and many of the horses were kept hobbled. In more recent years, ponies were often picketed. A short pin of ash wood was driven into the ground; to it was tied a lariat which was fastened about the horse's neck. In earlier days we never fastened a pony by rope or halter about his neck, fearing he might strangle himself.

There was always danger in summer that enemies might be lurking about. In the mornings especially, we feared attack, for a raiding party commonly spent the night in camp, making ready to strike at daybreak. For this reason we guarded our herds rather closely in the morning, but toward the latter part of the afternoon we felt it safe to drive them further out from the village.

Once when I was about eleven years old—it was the year following our camp at Buck-brush Eagle-pit—we thought no enemies were about, and late in the afternoon drove our horses six miles from the village for better pasture. Suddenly, enemies appeared and drove off about a hundred of our horses. We had thought it too late in the day to expect an attack, and our guards, perhaps, had grown a bit careless.

We had often to battle with enemies when I was a young man. During my lifetime, we Hidatsa, I think, have killed about two hundred enemies, as nearly as I can count. Enemies were far more likely to trouble us in summer than in winter. Still, even in winter, we had to guard our herds. Six times, within my memory, raiding parties came against us in winter and succeeded in driving off some of our horses. We pursued and killed some of these raiding enemies.

It was the duty of the boys of the household to herd the horses when they were grazing on the prairie or in the hills. We lads, as we guarded the herds, often hunted gophers or blackbirds, which we cooked at a fire and ate. Sometimes we played the arrow-shooting game, two boys shooting against two others, or just one against another. The wager was often a bird or a gopher.

We drove the horses to the Missouri to water them. We patted and stroked the colts as they drank so as to accustom them to being handled. They soon grew so tame that we could catch them in the prairie or the hills without trouble.

The Missouri is a deep stream, and is not very shallow usually, even near the shore. A young colt was helpless in water shallow enough for a man to stand upright. We lads took advantage of this fact. If a colt was a bit wild, we drove him into deeper water where a lad waded out to him and caught him; for, not being able to touch bottom, the colt could not escape. We then petted and stroked and rubbed the colt, so that he soon became gentle and let himself be caught whenever we wished.

*Corral under the Drying Stage.* It was our custom to drive the family herd in from the hills to the corral in the earth-lodge every night. If a man had more than five horses, there was not room in his lodge for all of them. During war, however, he kept them all in his lodge, putting up a second, or war corral, in the lodge to the left of the door as one enters. To accommodate a larger herd a corral was usually made underneath the drying stage which stood in front of the earth-lodge. The drying stage had a floor supported on posts, a little higher than a man's head. These posts we surrounded with triple railings of poles, running quite around the stage. A pole or rail ran from the front to the middle post, where it was joined to a second one which reached to the rear post. The rails which ran the width of the stage only, in front or rear, were single poles. The rails on the sides of the posts ran outside of the posts; but the front and rear rails ran on the inside of the posts, and rested upon the side rails I count as "front" the end of the stage in which was placed the gate.

The front rails were used as the gate and were let down and tied up again with a rawhide rope. All rails were bound in place with rawhide thong. A notch was cut on either side of the posts of the stage, within and without. Where it lay against the post and received the rope, the rail itself was also notched. The rope was bound around both rail and post. The lowermost railing lay about two feet from the ground; the second, about three feet; the uppermost, about four feet from the ground.

A gentle horse might be tied to one of the front posts, by one foot, with a rope or thong about four feet long. If all the horses were quite gentle, one might be tied to each post in this manner. A colt could be put with the other horses into the drying stage corral, which could receive horses up to the number of about twenty. In front of my father's earth-lodge we always had a drying stage and corral, but we kept our best horses, especially our best mares, in the corral inside the earth-lodge.



In the early morning, we threw cornhusks from our breakfast into the corral for the horses to eat, or else brought grass for them. They were not taken out on the prairie until about ten o'clock in the morning, as many families in the village might still be asleep; and anyway, it was rather quiet in the village during the breakfast hour. If at this hour an alarm were raised that enemies were stealing our horses, we could not expect as quick and vigorous a pursuit as would be the case later in the day.

Sometimes horses were hobbled in the timber about sunset and left for the night; for enemies were not likely to find them, hidden as they were in the trees. A stallion was never hobbled and left in the woods for the night, for he would struggle and fight to get away; or he would whinny and call to the mares so that any enemy who happened to be within hearing could discover where he was.

When we drove the family herd in at evening, only our two fast horses, Deer-horse and White-belly, and three mares were usually brought into the lodge; if, however, enemies were about, we sometimes brought the whole herd in, the five horses named going into the regular corral, and the others into the war corral to the right of the door as one leaves the lodge. Our mares were valuable for breeding and we did not want enemies to steal them.

Sometimes, if enemies were known to be about, a man of the household would make his bed out on the drying stage floor and stay there all night, watching the horses and singing. He sang so that the enemy would know he was guarding his horses.

*A Typical Summer Day's Herding by Boys.* I will now describe a typical day's herding by boys. Let us suppose that I was about fourteen or fifteen years of age, and that the time of year was about the present date (August 8). I recollect very well what occurred one particular day about this time of the year and will tell about it.

I arose after the sun was up, probably about eight or nine o'clock. Often, though not always, I went for a morning bath in the Missouri. In that case I proceeded to the river in moccasins, breechclout, and robe. While I bathed, I drank great quantities of the river water. When I was through bathing, I drew on my robe, and now that the water had settled well in my stomach, I vomited it up in order to wash my stomach clean. To do this, I stooped, and pressed my hands over my stomach, at the same time retching. The water came up from my stomach rather thick. It was the thick moistures I wanted to cast forth, and I felt



good after doing so.<sup>1</sup> Sometimes after bathing in the river, I rubbed my body with white clay. This made my body feel light. I let my hair hang loose, as it was wet from the bath in the river.

I returned home and put on my leggings and my shirt of white sheeting. Although I did not always wear my leggings during the night, I

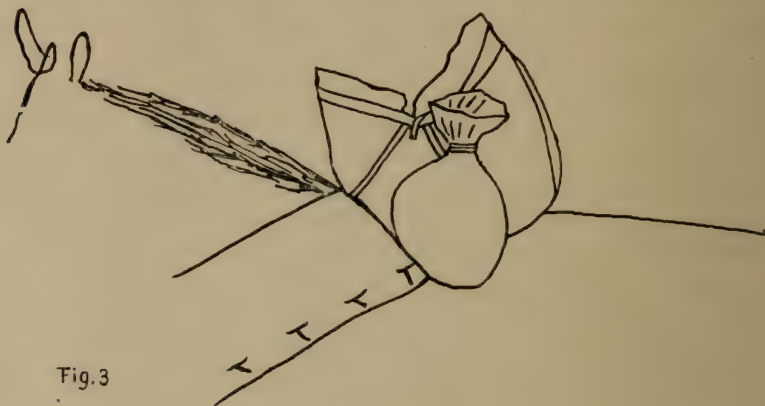


Fig. 3

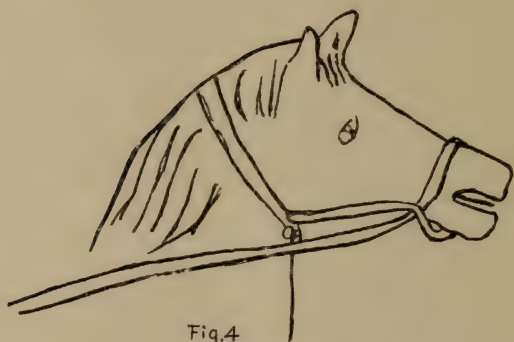


Fig. 4



Fig. 5

Fig. 3. A food-filled Heart Skin tied to the Belt with String.

Fig. 4. Method of tying a Halter.

Fig. 5. Carrying a Package of Maize Ears tied to the Elbow.

had slept in both leggings and shirt the previous night, but had taken them off to go to the bath. If I slept without my leggings, I always laid them beside my bed in readiness for the morning.

<sup>1</sup>Among all the Plains tribes bathing was a daily custom for the young and middle-aged. Even in winter a hole was broken in the ice and a plunge taken. Old men were appointed to see that boys took their baths regularly. However, the practice of the narrator in purging himself, has not heretofore come to our notice, except as an occasional feature of the preparation for a ceremony.

The rest of the family had eaten their morning meal while I was at the river. My mother gave me my breakfast when I came in. In a wooden bowl she had put boiled dried meat and a mess of parched corn-meal boiled with dried squash. She had parched the corn in a frying pan until brown, stirring it with a stick to keep from burning. She pounded the parched grain to meal in a wooden mortar. When she had brought the squash to a boil, she added the meal. To eat the mess, I probably had a buffalo horn spoon. Sometimes I ate with a mussel shell, or even with one of the big spoons made of a Rocky Mountain sheep horn. The broth in which the dried meat had been boiled, was served in a tin cup for a hot drink, as we now serve coffee.

Breakfast eaten, my father said to me: "It is time for you to take out the horses. Keep careful watch in the hills. If you sight any strangers who look like enemies, hasten back to the village. Leave your lariat on the neck of your saddle horse and let it drag, so that if an enemy appears, you can quickly catch your horse."

My mother handed me my midday lunch, a double handful of whole parched corn, mixed with minced pieces of dried kidney fats. It was tied up in a heart skin which I fastened by a string to my belt over my left hip (Fig. 3). I also picked out four long ears of white corn from the harvest of the previous year and tied them up, in a piece of cloth. Around this bundle I passed a piece of thong, tied the ends in a loop, passed my left arm through the loop, and so carried the bundle slung on my left elbow (Fig. 5).

I caught one of the mares in the corral, and put on her a halter made of a flat rawhide lariat (Fig. 4). "That is right," said my father. "Drive the horses to the river and let them swim to cool off their bodies, that they may better enjoy their grazing."

About sunrise, and before he had eaten his breakfast, my father had driven the two best horses and the three mares of our herd to the corral under the corn stage; for all five horses had been stabled for the night in the corral in the lodge. Our stallion had been kept in the corn stage corral all night; and as no mares were then there, he had kept quiet.

The regular place for the corral in the earth-lodge was to the left of the entrance; but in time of war, when there was danger of enemies entering the village, a second corral was made to the right of the door, using "left" and "right" in the Indian sense, as of one standing at the fireplace and facing the door. This second corral was fenced off against the fire screen (Fig. 6). In the diagram I have indicated the places for the gates. The crosses mark where we fed dried grass to the horses. As

will be noted, the grass was fed in the rear of one corral and along the front of the second.

When it was necessary, as in war times, to take the whole herd into the lodge, the stallion was tied by one fore foot to the post marked *p* in

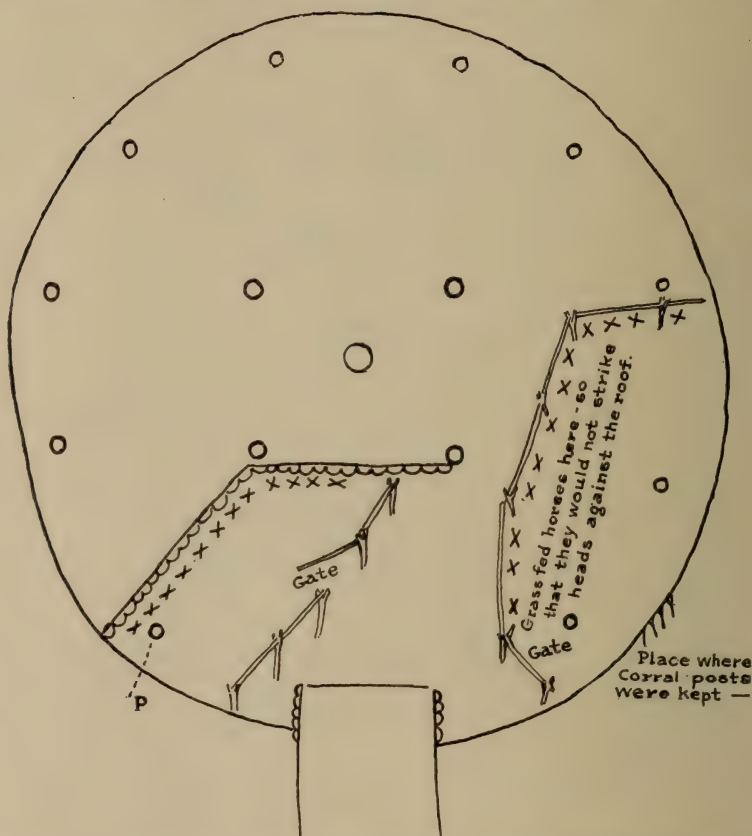


Fig. 6. Diagram of Interior of Earth-Lodge, showing Position of Corrals. The Corral on the left is the War Corral. *p*, Post where Stallion was tied; X—X, the points where grass was fed to the horses.

the diagram (Fig. 6). This was one of the exterior supporting posts, and stood between the fire screen and the door. Mares were distributed indifferently in either corral.

In our family, it was the custom to keep the four or five posts of the war corral standing, fork upward, outside the lodge and on the left of the door as marked in the diagram (Fig. 6). Lengthwise on the ground

beside these posts were laid the corral rails. We preserved these posts and rails even in peace times, for they were hard to get. We had to go two miles up the Missouri to cut them, and return in a boat, floating the rails in the current.

We considered the war corral as an emergency corral, to be put up only in times of extreme danger. When the danger was past the corral was taken down, and the floor was swept with native brooms of buck

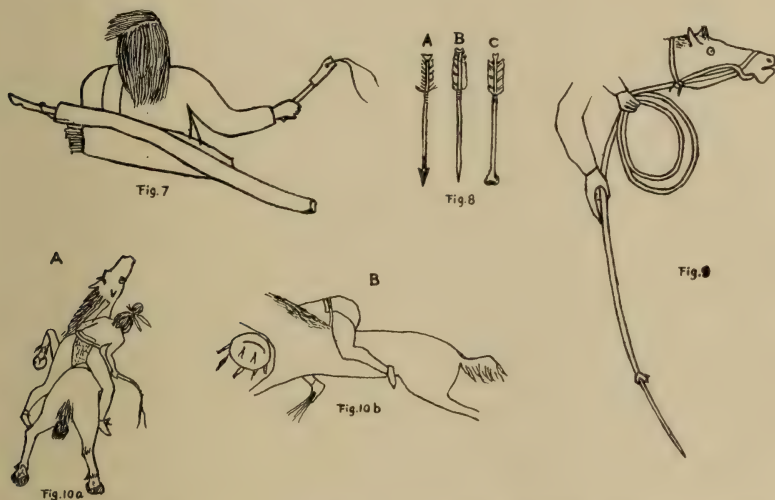


Fig. 7. A Bow Case and Quiver in one Piece, showing Method of Carrying; also a Willow Quirt with Rawhide Lashes.

Fig. 8. Arrows. A, with iron head and prairie-chicken feathers; B, pointed wooden shafts and duck or owl feathers; C, blunt-headed, with duck or owl feathers.

Fig. 9. Guiding a Horse with a Halter to the end of which is tied a Buckskin Lash.

Fig. 10. Riding Horses. Two views of a warrior leaning over the side of his horse, to keep out of sight of the enemy.

brush. For that matter, every morning the corrals inside the lodge were swept with these brooms by the women of the household. The dung and other refuse were borne in skin baskets to the Missouri and pitched over the bank.

Having haltered one of the mares, as already described, I unbound the thongs that fastened the gate rails, and leaving these on the ground, I let the horses out of the corn stage corral. I mounted the haltered mare and drove the herd to the river. Now that the corn stage corral was empty, my mother cleaned it up as she had already done with the corral



inside the lodge. We always kept the ground neat and clean about our lodge.

As I started off on my mare my father said, "If you meet enemies while you are guarding your horses, try to escape and return home. If you cannot escape, stand against them like a man and make good use of your arrows!"

I had an unbacked, self bow of chokecherry wood, and a quiver of arrows which I carried on my back. The bow case and quiver were in one piece (Fig. 7). Of the three kinds of arrows in my quiver, five or six had iron heads and were feathered with prairie-chicken feathers (Fig. 8a); two were blunt-headed (Fig. 8c); and seven or eight were pointed wooden shafts, like Fig. 8b. The last two kinds were feathered with duck or owl feathers.

The blunt-headed arrows were for birds; those with iron heads for enemies; and those of pointed wood (Fig. 8b) for gophers and small game. With these last we also played arrow games. The pointed wooden arrows were prepared by shaving the end of the shaft to a point, oiling it with grease, and holding it over a fire of coals to harden it. The other arrows were not treated in this way. The blunt-headed arrows were of chokecherry wood; the others were of juneberry shoots. Juneberry wood is dense and heavy, while chokecherry wood is lighter and better suited for the rather clumsy blunt-headed shafts. A dense, heavy wood would have made these arrows too heavy.

For shooting at birds we also used another kind of arrow that had thorns bound to the side of the shaft near the point. I did not take any of this kind with me this day because they were not much used out on the prairie, their chief use being for shooting through a flock of birds, or at a bird up in a tree. Besides to have carried thorn arrows in my quiver would have injured the feathers of my other arrows, for the thorns would have torn the plumes as I drew them from the quiver.

My father was an arrow maker, and had made all my arrows for me. They were therefore quite handsome. They were feathered with plumes from the wing of an owl, a prairie-chicken, or a duck. "These arrows, feathered with prairie chicken-feathers, are the best," my father said to me. "They will fly swiftly." He feathered the five or six iron-headed arrows with prairie-chicken feathers, three plumes to a shaft. The other arrows were irregularly feathered. Some had all three plumes of owl or duck feathers, others had some duck and some owl feathers.

My bow was thrust into the quiver with the loose loop of the bow-string hanging out, as in Fig. 7. In battle the quiver was turned so that

the arrows were in front, though sometimes the quiver was tied to the belt.

I also carried an unpainted willow quirt, sometimes in my hand, sometimes thrust in my belt. It bore two lashes of rawhide. I never whipped my horse with it. My father once had a vision; he gave me this quirt to carry as a sacred object, because of what he had seen in the vision. "Carry this quirt, my son," he said, "and keep it as a sacred object. I will give you a whip song to sing to it. When you are alone, cry and pray to it; and you may then expect to strike an enemy with it some day." Goodbird has drawn this quirt as I have described it to him (Fig. 7).

If I were attacked by enemies, however, and were in danger of capture, I should have whipped my horse with the quirt. I should have expected the quirt to have supernatural power that would cause my horse to run swiftly. My idea would have been that since the quirt was a sacred object, seen by my father in a vision, it had sacred power which I would have invoked in this way.

As shown in Fig. 7, I wore my hair loose. I did not wear a braided scalplock. When an enemy fell, the first man to strike coup on his body cut out the crown; and the others who also struck coup would in a twinkling strip the whole skull of the scalp. We banged the front of our hair and combed it back. The hair was cut short below each ear. That on the back of the head was let grow, and was sometimes tied in a bunch, or knot, much as white women do. In olden times, Hidatsa women did not braid their hair as they do now, but made a knot of it over the forehead.

Well, as I have said, I drove the herd down to the river, at a place west of the village. After the horses had drunk their fill, I forced them into the water and made them swim or wade to their full depth.<sup>1</sup> Then I dismounted, let my mare drink, and drove her into the water; and holding her by the lariat, I made her wade almost beyond her depth.

At the end of the lariat I had made a hole in which I had tied a piece of soft buckskin for a lash (Fig. 9). This lariat end I used as a whip, giving it a jerking throw so that it made a cracking noise. I think it was very much as you describe the white man's custom of cracking a black-snake whip. As will be noted in Fig. 9, the index finger is extended its entire length down the lariat; this was always done when one threw the whip (or lariat end) to make it crack.

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<sup>1</sup>" . . . Drove of horses cover the prairie, slowly driven towards the river; when they approach, the bathers leave the water, and their places are quickly filled by the restless, half-wild horses, who, urged by the yells and cries of their drivers, rush pell-mell in. After drinking and swimming about, they scramble out, and forcing their way through the incoming droves, quickly rejoin their companions. When each band is collected again, they are driven up to their owner's lodge, and secured for the night." Boller, *ibid.*, 61.

The halter shown in Fig. 9 (and which is the same as that in Fig. 5) we call *ápa-píhě*, from *ápa*, nose, and *apíhě*, something hanging. Such a halter was used for short home journeys, such as passing to and from pasture, to the river to water, and the like.

All twelve horses in our family herd were Indian ponies. The mare I rode was a dark bay with a white spot. Another, called Deer-horse, was a dark bay; a third, White-tail, was a grey. A good many of the herd were red, or bay; some had white hind legs, and as I have described elsewhere, one had a white belly.

It was not hard to guide the mare with a single rein and noose over the nose as shown in Fig. 9. If the rein was drawn to the right, the pony understood and followed; if drawn to the left, the pony obeyed. As may be seen in Fig. 9, the lariat fell to the right of the horse. A well-trained pony could be guided merely by putting a noose over the neck and drawing the lariat to right or left. A third way to guide a horse was, as elsewhere described, by throwing the weight of the rider's body to right or left. The horse, if well trained, would understand and obey.

Especially in battle, a warrior would often throw himself down on one side of his pony, when at once the animal would swerve toward the side on which the man clung. A warrior dropped on the right or left side of his pony indifferently. A man unable to do so, but who, for want of training, sat straight on his pony, would soon be shot in battle. When a warrior dropped on the side of his pony, all that could be seen of him from the opposite side was one leg and part of his thigh.

It was not our custom to use a saddle in battle, because it would then have been impossible to drop on the side of the pony.<sup>1</sup> Goodbird has drawn two views of a warrior dropping on the side of his horse (Fig. 10). In Fig. 10*a*, the warrior is seen from the rear as he drops down on the side of his pony, and the animal is swerving to the right. Fig. 10*b* is a side view; in this case, the enemy on the left can see only the man's left leg, his thigh, and a little bit of his belt. When a rider dropped on the side of his horse, he held on chiefly by the inside of his thigh. It was much easier to stick on a pony when the pony's body was sweaty. It will be

<sup>1</sup>Maximilian visited a Hidatsa village November 26, 1833 and remarks that "The scenes which are inseparable from the dwellings of the Indians soon appeared; slender young man, galloping without saddle . . ." (Maximilian, *ibid.*, vol. 3, 24.)

" . . . Several tall, athletic men were on horseback, and managed their horses, which were frightened by the noise of the steam-boats, with an ease which afforded us pleasure. Urging them with their short whips in the manner of the Cossacks, with the bridle fastened to the lower jaw, they, at length pushed the light, spirited animals through the willow thicket, till they reached the river, where these fine bold horsemen, resembling the Circassians, with their red-painted countenances were regarded with great admiration. Many of them wore the large valuable necklace, made of long bears' claws, and their handsomely-painted buffalo robe was fastened round the waist by a girdle. In general they had no stirrups, but sat very firmly on the naked backs of the horses, and several rode on a saddle resembling the Hungarian saddle." (Maximilian, *ibid.*, vol. 1, 360.)



noted that the warrior's hair is tied in a knot just back of his forehead. The horse's tail is also knotted. In the knot in his hair the warrior fastened his individual sacred charm, or medicine, which he carried with him into battle. Only a few tied their hair in this manner, men who had been so directed in a vision, or who for some other good reason, thought it necessary to do so.

When going into battle, a warrior stripped off his leggings and sometimes, but not always, his shirt. I recollect that a warrior once threw himself on the side of his horse with his shield hanging from his back, but swinging forward so that it could be seen. The enemy shot at him and he was hit in the right foot on the far side of his horse. This is represented in Fig. 10*b*. The man was afterwards called Shot-foot.

A man unaccustomed to riding horseback, and sitting on a pony for the first time, will very likely have the skin fretted off the end of his spine. To such a novice, riding a single mile will be enough to do this. But we Indians did not sit squarely nor heavily on our horses. We pressed the thighs against the horse's sides. When the horse sweated, it was easy to stick to his sides when riding bareback, as in battle.

After watering the horses at the river, I drove them about a mile from the village, where I found some of my boy friends, who had reached the grazing grounds before me. They were Iduhíc, or Stands-up, seventeen years old, and Idocic, or Garter-snake, sixteen years old. As nearly as I can recollect, I was nearly or quite fifteen years old at the time. My two friends were hunting buffalo birds, or cow birds, among the horses. These birds are dark brown or black.

After driving my horses into the grazing herd, I dismounted and hobbled my mare, leaving the long lariat on her neck with the end trailing on the ground. I found the two boys had already killed three birds, which they had laid beside their two little bundles of parched corn brought for their lunch. "Have you shot some birds already?" I asked. "Yes," they answered, "but they are getting scarce now, for we have frightened them." We find it hard to get near any now."

As I talked to the boys, I looked about me. In all directions, within a radius of a quarter or half mile, were scattered herds of horses, grazing. Boys were herding most of them, but in the distance I saw one man guarding a herd. I added my horses to those of my two friends. One of these had five horses, the other, about ten; so we had about twenty-seven in the herd we were guarding.

We now started to hunt gophers. With some hair that I pulled from the mane of my mare, I made a snare and tied it to the end of my lariat.



I set the noose in a gopher's hole. Soon the gopher thrust out his head and I drew the noose taut. The little animal tried to get back into his hole, but I hurried up to it, holding on to the lariat and passing it through my hands, hand over hand. When I reached the hole I drew the gopher out and with a quick swing of the noose, dashed it against the ground, killing it. This had to be done quickly, for a gopher can bite. In this manner we caught about eight gophers, which we took to the place where we had left our lunch.

"It is now noon," said Stands-up. "I will go to the village and bring some fire." He ran off afoot. Meanwhile we other two boys went down into the timber, a quarter of a mile away, and brought some dry wood for fuel.

We were first to return, but Stands-up soon joined us bringing some coals of fire in a pail. We built a fire by placing the coals on the ground and laying little sticks on them, blowing the coals with our mouths. We added larger sticks and soon had a good fire. First we roasted the birds. A sharpened stick was thrust into the flesh at the vent and I held the bird over the fire with this stick, until it was roasted. The entrails were not drawn, neither were the feathers plucked.

When roasted, I broke the bird open and threw the entrails away. I plucked out the wing feathers and stumps of the smaller feathers with my fingers and threw them away also. I ate the bird, biting the flesh off with my teeth; I did not pull it off with my fingers. We ate none of the corn with the roasted birds at this time. Of course, each of the other boys as well as myself, roasted and ate a bird.

Then we roasted gophers. First we opened the gophers and drew out the entrails with our fingers. The lips of the opening made in the carcass of the gopher for the purpose of removing the entrails, were now skewered together by a spit thrust in near the tail. Fig. 14 will show how the belly of the gopher was skewered shut. The carcass was held in the fire until the hair was singed, when it was taken out and scraped with a stick to remove the charred hair. It was then held about five inches from the fire, being turned now with one side, now with the other, toward the fire. The spit was held in the hand.

Each boy roasted the gopher he ate. In all we ate five gophers, dividing them between us equally. We left three gophers unroasted; but before the fire died down, we singed the hair of these three and put the carcasses away with the corn we had brought for lunch, covering both gophers and corn with a blanket.

We buried the fire, digging a shallow hole and raking the coals into it. We covered the coals with dried horse dung, and put earth over this. We knew the fire would smoulder beneath until we wanted it again.

We noticed now that some of the herders were driving their horses to water, so we knew it was time for us to do likewise. I caught and unhobbled my grey mare; for when I began to snare gophers, I had taken the lariat off her neck.

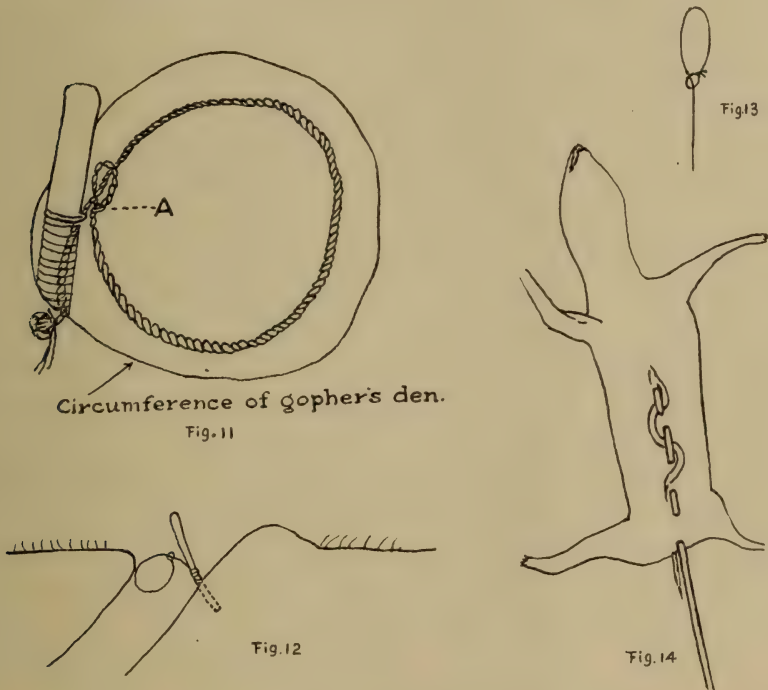


Fig. 11. A Snare set in a Gopher Hole.

Fig. 12. A Stick with a Snare bound to it set in a Gopher Hole.

Fig. 13. Noose tied in a Lariat for a Gopher Snare.

Fig. 14. Sketch of a Gopher with Skewer thrust through it, preparatory to Roasting over a Fire.

There was a pond not far away, but the water was not good to drink, as there were little worms in it. We watered our horses at the Missouri, and we ourselves drank freely and also bathed. Meanwhile we had tied our riding horses each to a good big stone, usually about a foot thick, giving the lariat a turn or two about it.

After our bath, we got our riding horses and went up the bank to find the rest of the herd already half way back to the grazing grounds. They were going along at a leisurely pace, stopping now and then to graze. We caught up to them and drove them to our camp again. Here I hobbled my mare, letting the lariat drag.

We now ate our parched corn. We opened the fire, and found the coals still glowing. We added fuel and roasted the three gophers we had saved, each boy eating one. The gophers were fat and made us feel good. I also parched two of the ears of corn I had brought. I made a little bed of coals, laid the ears of corn upon it, and rolled them about with a stick, until they were parched brown. I liked corn parched in this way. The two ears I had not used, I kept to take back home with me. "These are fine ears," I thought. "I chose them because they were the most select and I may want them again."

After our meal we began again to catch gophers; but as we had been hunting them all morning, they had become frightened and were slow to show themselves. "I know how to catch these gophers," said Garter-snake at last. "Once before when I was hunting them, they became frightened and did not show themselves, and we poured water down their holes. This made them come up."

"You go to the village and bring us a pail," said Stands-up and Garter-snake to me. I ran off to the village and soon returned with the pail. We also had the small one in which we had brought the fire. We filled the two pails at the pond and brought them to a gopher hole. We dug out the top of the hole with a knife to a depth of about seven inches and a diameter of five inches. This was to make a kind of funnel into which to pour the water. Garter-snake emptied one pail, I the second. We each stood ready with a stick. The gopher came up, ran back, came up again, ran back, then came up a third time; the fourth time, Garter-snake killed it with his stick. We found two gophers in this hole and killed them both. As they were dripping wet, we laid them in the sun near our fireplace to dry.

"Let us now shoot at a mark," said Stands-up. He took one of his wooden pointed arrows, thrust it by the feathered end into the ground, and upon the point stuck a small ball of horse dung. We went about thirty yards away. "Let us shoot two arrows each," said Stands-up. "Whoever hits the ball of dung shall have the two gophers we drowned out of the hole."

"You shoot first," said Garter-snake to me. I shot my arrows quite close to the mark. Garter-snake and Stands-up shot, neither hitting the



mark. The second round, Garter-snake shot first, Stands-up shot second, and I third. We used only sharp wooden arrows. As soon as one shot, he ran and picked up his arrow.

The third round, Garter-snake shot first, hitting the ball of dung the first time. "There," he cried, "I eat the two gophers." He disemboweled them and made ready to roast them. "Now," he said, "I will give you two boys one of the gophers to divide between you. But while I am roasting them, see if you cannot catch another, and I will have my share of it."

"Agreed," I cried. Stands-up and I filled the two pails at the pond, and listening a few moments, heard *w-s-s-s-s!* the hissing bark of a gopher. We looked and spied the gopher; he dived into his hole.

"It may not be a deep hole," said Stands-up, as he emptied the smaller of the pails which he held. The gopher did not come up. Stands-up filled the hole with water from the larger pail and as the gopher dashed out, he killed it with a blow of his bow. Drowned from their holes, gophers were easy to kill as they came up with their eyes shut, no doubt on account of the water.

I took the dead gopher to Garter-snake. "Here is the gopher you wanted," I said. "Good," he answered. "Now you roast it." I did so, and said, "We agreed to divide this gopher, but I think it would be better if we shot again for it." "Agreed," said Garter-snake. "Whoever shoots the farthest, shall eat this gopher." "Then I shall eat it," laughed Stands-up, as he shot. I followed, but my arrow failed to fly as far as his.

Garter-snake took up his bow. "I am sorry," he said, "that your arrows did not go farther. Now watch me!" He had a sinew backed bow. He put an arrow on the string, drew it, and though he aimed at a rather low angle, his arrow went farthest of the three. We had shot with wooden pointed arrows (Fig. 8*b*).

"Now," said Garter-snake, "this is my gopher; but I am going to divide it with you, only I will take the chest, the best part. You boys may eat the back part (sic). I don't like it anyway." We divided the gopher, Garter-snake eating the fore quarters, and Stands-up and myself the hind quarters.

It was now about three o'clock in the afternoon.

We again hunted gophers, but in another way. We set snares in the holes, but anchored them to sticks thrust in the holes while we went to play. The noose we used for a set snare was somewhat different from that which we fastened on the end of a lariat. The latter was a simple noose, like Fig. 13. The noose of a set snare was like Fig. 11*A*; it had a tighter



eye, with a small sinew binding that would not slip back. When a gopher came out and found its head caught, it dived back into the hole, pulling tight both the main and the secondary noose, or eye, enclosed by the sinew binding. This kept the bigger noose from slipping open and the gopher could not therefore get away. The stick with the snare bound to it was set at one side of the hole, partly closing it (Fig. 12).

Another kind of snare was made of a bowstring. The noose end of the bowstring was laid in the hole. When the gopher was caught it was pulled out with the bow instead of a lariat.

As I have said, we three boys set snares in the gopher holes and went off to play. First we shot at a stick, or at an arrow stuck upright in the ground. This was a kind of gambling game.

Other boys who had been herding their horses some distance away now came up, and we had a sham battle on horseback. We used round-headed, or blunt, arrows (Fig. 8c). In the group were about ten boys, all of about the same age as my companions and I. Butterfly and Fingernail, I remember, were two of the boys.

We practised fancy riding. One boy would ride along, dismount, and mount again, at a gallop. Another boy stood with his bow ready; a second boy galloped up near him, dropped on the farther side of his horse and swerved past, while the boy with the bow shot at the rider's horse.

Sometimes I galloped up to a boy, hidden behind my horse with only my leg exposed over the pony's back. The boy could see nothing but this exposed leg as I approached him. I struck him as I would an enemy; but as I galloped away, he shot at me as he was now able to see my body. Of course, as I galloped away, my horse turned, exposing my body to the other boy's arrow.

The easiest way to mount a horse is to put the left elbow forward over the back of the horse, seize the horse's mane with the right hand, and leap up, lying on the abdomen transversely over the horse's back; then throw the left leg over and rise to a sitting position. In battle we could not be so deliberate as we ran the risk of being shot at by the enemy. We boys therefore practised leaping from our ponies and mounting them again at a gallop. Seizing the mane with the right hand, one leaped from the right foot, with the left foot lifted high, and vaulted on the horse's back at one bound.

Then we played that I was thrown from my horse, or that my horse had been killed; and another boy rode forward to save me, carrying me off on his pony with him. The rescuer stopped his pony; I ran forward,

placed both hands on the horse's hips and leaped up behind the other, very much as white children play leap-frog. Being trained to this, the horse did not kick.

Once in a battle, when I was about twenty-five years of age, Two-bulls' horse was killed by a shot in the head. Two-bulls leaped to the ground and ran. Our enemies numbered about nine hundred and ninety-five (sic.) We were but thirty. One of our men, Bears-in-water, was riding away, but at sight of Two-bulls' plight, reined in his horse and looked back. Two-bulls understood; he ran forward, put his hands on the hips of Bears-in-water's horse, leaped to the pony's back, and both he and Two-bulls galloped off in safety. All these games were intended as preparation for battle, for all the boys expected to go to war as they grew older. In these pony games I always rode my old grey mare.

We next practised archery for a long while, using our bows again as we thought we would in battle. We put a stick in the ground and shot at it, just to see who was the best shot; or, we took turns, each boy running forward, stopping suddenly, and shooting instantly. Very often a boy dashed past the mark, shooting at it as he ran. Sometimes the boys shot at one another, being careful, however, not to shoot hard. The boy who was the target tried to dodge the arrow, springing to right or left, or dropping suddenly, so that the arrow passed by or over him. Only blunt arrows were used, at a distance of twenty or thirty yards. We practised dodging arrows, because we expected to have to do so in war. This story will illustrate the value of expertness in such play:—

A man named Wolf-grass was going along afoot when he was attacked by an unmounted enemy, who wore a handsome costume and war-bonnet. This enemy shot again and again, but Wolf-grass put his robe over his left arm, and with his eyes just over the edge of the robe, dodged his enemy's arrows every time. His enemy advanced rapidly, and when close, sent a final arrow that lodged in Wolf-grass's robe. Wolf-grass struck him with his bow. Other Hidatsa came up and killed that enemy; and in a twinkling had cut him to pieces and torn the fine clothing from his body.

Of course, we guarded our horses all the time of our play, keeping our saddle horses close by and in readiness for any emergency. No matter what our play, we watched our herd and had our saddle horses ready.

At about half past four, we went to look at our gopher snares. We had set six snares and found two gophers caught in them; these we took out. "I do not believe that we want to eat these gophers today," said Stands-up. "Who wants them?" "I do," I answered quickly, and picked them up.

We now mounted our horses, drove the whole herd to the river and watered them. I cut out my bunch of horses from the herd, the other boys cut out theirs, and we all returned to the village, arriving a little before sundown.

I drove my horses to my father's door, dismounted, and went in. My father was lying on his bed. "Are all the horses here?" he asked. "They are outside," I answered. "Good, I will attend to them," he said.

The other members of the family had already eaten their evening meal. I spread my blanket on the earth floor between the two forward main posts of the lodge and my mother brought me my supper in a wooden feast bowl, with a big Rocky Mountain sheep horn spoon to eat it with. The mess was hominy of pounded yellow corn, boiled with beans, and seasoned with spring salt-alkali salt, gathered from the edge of a spring. It was a dish that I liked.

My father meanwhile brought his five best horses into the lodge for the night; the remaining seven he left without, in the corral under the drying stage.

#### WINTER CARE OF HORSES.

When I was eight years old, as nearly as I remember, we came from Like-a-fishhook village and wintered across from Independence in the timber we call Macúkākca-âmaci-midac, or Buckbrush-pit-timber. The name comes from an old eagle pit that was about two miles from the place we chose for our winter camp.<sup>1</sup>

There is a tradition that some hunters found quantities of small eagle feathers caught in the buckbrush that stood there. The hunters did not know how the feathers came to be in the buckbrush, but they thought the feathers gave promise of good eagle hunting. They dug a pit and caught many eagles. Doubtless they put the pit on the west side of the hills that are there. One can see the place from the top of Independence hill, but I do not think anyone knows just the spot where the eagle pit lay, not now anyway.

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<sup>1</sup>John B. Dunbar in his account of the Pawnee writes:—

"They went into winter quarters in some place where water, wood and unburnt grass in abundance for the horses were to be had. Here they remained till forage became scarce, when another place was sought. If grass could not be found in sufficient quantity, they cut cotton-wood trees, and subsisted the horses on the bark and tender twigs. The return to the villages did not take place till young grass was started in the spring." (*Magazine of American History*, 1882, vol. 5, no. 5, 332.)

"The Aricaras do not provide any better for their horses than the other nations of the Missouri. They cut down the cotton wood (*Populus angulosa*), and the horses feed on the bark and smaller branches. I have seen instances exhibiting proofs that these poor animals have eaten branches two inches in diameter." Bradbury, John, *Travels in the Interior of America in the Years 1809, 1810 and 1811* (Liverpool, 1817), 165.



A man named Son-of-a-star was taken with smallpox this winter. He caught the disease from some Mandan, who were then wintering near what is now Fort Stevenson.

The next winter we camped again at Buckbrush-pit Timber. Two sons of a man named Stone, an Arikara half-breed, were killed. With other young men, they were hunting, and their horses strayed. The two brothers and a third young man remained behind to search for the horses. They camped for the night. The next day, as they were coming home, enemies surprised the three men and killed them.

I was ten years old the next winter, when we again wintered in Buckbrush-pit Timber. There were many buffaloes about; and when parties went out to hunt the herds, I used to go along to help take care of the horses. When buffaloes were sighted, the hunters hastened on to give chase, leaving me to guard the pack horses. I rode one, driving the others before me.

I wore, I remember, a cap of buffalo skin, with the fur in, and leggings. I did not wear a clout then; cloth for a breechelout was hard to get and a boy of my age did not wear a clout anyway. I was young and hardy and did not feel the cold; this, in spite of the fact that the weather was cold.

Some of the young men wore no shirts when chasing the buffaloes. They had painted their bodies and the skin behind their ears, with white clay. They hunted with bows and arrows. A few, it is true, owned guns, but preferred to save their powder for fighting enemies.

The next winter, for the fourth time, we camped at Buckbrush-pit Timber. I was eleven years old. Again there were many buffaloes for the hunting. Enemies stole horses from us this winter. We trailed them and slew one; the rest scattered and escaped to the north.

At the time these enemies stole our horses, I remember my father's family kept their horses in two places. The most valued horses, those that were our best and which we most often used, we kept in the lodge at night. Those less valued, and those which were rather wild, we left out in the hills, even at night; but some of these were kept hobbled. So also did other families. Now I will tell how the village herds were cared for in the winter camp, as I remember it from the time when I was eleven years of age, when we still went into winter camps; for later, when the buffaloes were killed off, we no longer followed our older tribal custom of going into winter camp each year.

*Winter Lodges and Drying Stages.* Our winter camp was of earth-lodges, but these were smaller and less carefully built than were our sum-



mer<sup>1</sup> lodges. As in our summer village, there was a drying stage before every door, but it was smaller; and as it was intended to last only for the winter, it was rather carelessly built. It was like the summer corn-drying stage, but rougher. There were six posts, three on a side, and poles projecting upward supported stringers on which meat was dried. The floor was roughly made of poles and slabs, but not neatly as in the case of the summer stage.

A winter stage was not used for drying corn, of course, but for drying meat. Dried in the cold winter air, meat tasted differently from that dried in the summer sun, or in the smoke of a fire, and I liked it best. Meat hung on the winter stage, or anything laid on the stage floor, was out of reach of the dogs.

It was upon the floor of the winter stage, out of reach of the dogs, that my mother used to toss buffalo bones, to await the time when they could be pounded up for boiling to make bone grease or marrow butter. My mother, I remember, gathered up the leg bones to pound separately; for the bone grease so obtained was of a better kind, being yellow and never hardening. Bone grease from leg bones my mother called "foot-bone grease." Bone grease from shoulder bones and backbones was harder.

On the floor of the winter drying stage, also, were stored bundles of hay, or dried grass, for feeding the horses; but I will tell of that later.

*Number of Horses and Lodges.* I do not know how many lodges were in the winter camp. I remember we camped this year in three separate places in the timber; guessing at it, I should say there were perhaps, from ten to twenty lodges in each of the three camping places. There were perhaps, and again I am guessing, about two hundred horses in the tribe,<sup>1</sup> all, or nearly all, ponies. I think every lodge owned some ponies, but the number varied in the families.

Now all the best horses were kept in the family's lodge at night; but at the utmost, not more than ten could be so housed in one lodge.<sup>2</sup> The less valuable part of the village herds was left out in the hills. As I recollect, there were more ponies left in the hills, than were driven into the lodges, at night. As in the summer lodge, the ponies were kept in a pen, or corral, in the lodge.

<sup>1</sup>" . . . They have about 250 or 300 horses in their three villages . . ." (Maximilian, vol. 2, 370).

<sup>2</sup>" . . . Inside of the winter huts is a particular compartment, where the horses are put in the evening, and fed with maize. In the daytime they are driven into the prairie, and feed in the bushes, on the bark of poplars. There are, probably, above 300 horses in the two Mandan villages. . . ." (Maximilian, vol. 2, 272).

*Feeding Cottonwood Bark.* We fed our more valuable lodge-kept horses the bark, tops, and small branches of cottonwood trees.<sup>1</sup> Such fodder we fed them every night when we could get it. I am speaking of course of our winter camp.

On pleasant days the women of the household went out every afternoon about two o'clock for bark. They commonly cut down two or three small trees, of perhaps a foot in diameter. They cut the rough, outer bark from the trunks; stripped the green, inner bark off in pieces, many of them as long as my arm and as broad as my hand; and lopped off the tender tops and smaller branches. Both bark and branches the women bore to the lodge with their pack straps. They often made three or four trips before all the bark was brought in; and they were careful to strip the trunks thoroughly, for if they did not, any horses in the woods were sure to browse on the bark and branches of the felled trees and the women's labor would be lost.

As this was the fourth year we had wintered in Buckbrush-pit Timber, the cottonwoods were becoming pretty well cut off about our camping place, so that the women often had to go some distance to find suitable trees. Sometimes the man of the family went out to help, cutting down the trees and carrying home the heavier loads.

Brought into the lodge, branches and bark were piled near the fire to thaw.<sup>2</sup> About sunset, they were piled under the corral railing for the ponies to eat. The horses ate chiefly at night, but some of the fodder was saved for the morning.

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<sup>1</sup>"... Drewyer arrived with the horses about the same time, the horses appeared much fatigued I directed some meal brands [bran] given them moistened with a little water but to my astonishment found that they would not eat it but preferred the bark of the cotton wood which forms the principall article of food usually given them by their Indian masters in the winter season; for this purpose they cause the tree to be felled by their women and the horses feed on the boughs and bark of their tender branches, the Indians in our neighbourhood are frequently pilfered of their horses by the Recares, Souixs and Assiniboinss and therefore make it an invariable rule to put their horses in their lodges at night. in this situation the only food of the horse consists of a few sticks of the cottonwood from the size of a man's finger to that of his arm. the Indians are invariably severe riders, and frequently have occasion for many days together through the whole course of the day to employ their horses in pursuing the Buffaloe or transporting meat to their vilages during which time they are seldom suffered to tast food; at night the Horse returned to his stall where his food is what seems to me a scanty allowance of wood. under these circumstances it would seem that their horses could not long exist or at least could not retain their flesh and strength, but the contrary is the fact, this valuable anamall under all those disadvantages is seldom seen meager or unfit for service." (Lewis and Clark, *Original Journals*, vol. 1, 258-259).

<sup>2</sup>Boller, *ibid.*, gives us the following as to the winter care and feeding of horses:—

"When they reach the lodges, the wood is thrown down and piled, the kettle put over the fire, and cooking goes on again. Then the cottonwood bark is to be thawed, and peeled in thin strips to feed the horses;" (195).

"When the snow lies deep on the ground, and enemies are less numerous, (from the fear of being easily tracked,) most of the horses are left out at night, and only brought up when wanted for hunting. If the grass is plenty, and they can get a fair allowance of cottonwood bark, they may be kept in good order all winter; but if hard hunted, and brought up every night, by the time spring comes they are so reduced that only the very best horses can then 'catch' buffalo.

"Cottonwood bark is very nourishing, and if judiciously fed, a horse will fatten on it. A tree is cut down, the tender boughs lopped off, and after warming it to take out the frost, the bark is peeled and torn into strips of various lengths, resembling pine shavings; the knots and rough pieces are carefully thrown away, and it is then ready for use." (199).

I remember that the men of the household sometimes helped break the thawed bark into pieces about eight inches long which they piled with the branches under the railing for the ponies to eat. Sometimes, too, they helped strip off the bark from the larger limbs, after these had thawed.

The horses stood facing the fire as they fed. Twigs and smaller branches they ate readily; but limbs as thick as my wrist, they stripped of bark with their teeth. For this reason, the twigs and branchlets had been cut off and were piled by themselves. The thicker limbs, thus freed of branches, were more easily stripped by the ponies' teeth.

This custom of feeding cottonwood bark in the lodge was true of our more valuable horses. The year of which I am telling, we had nine ponies in my father's lodge. But this number might easily be broken. A sister or an aunt (either blood-related aunt or band aunt) might present valuables to the owner and receive a return gift of a pony. All the nine ponies of my father's herd that he valued, he brought into the lodge to care for and feed; for my father was a provident man, and was wise enough to bring his horses into the lodge every night.

We did not dare let our good horses stay out on the prairie at night, for enemies were frequently troublesome, and a foolish man might thus lose all his horses. Now we can turn our ponies out to pasture without fear of enemies; but it was not so in olden times.

We fed our horses no other kind of bark than cottonwood. It fattened the horses.

*Feeding Dry Grass.* I have said that the winter drying stage, used chiefly for curing meat, was a storage place for bundles of dry grass, or hay. On the stage in front of my father's lodge, I remember, there were usually two or three of these big bundles, or bales, lying in one corner of the stage floor. A small log was laid over them to stay them in the wind.

The women of a household would go out with iron hoes and clean away the snow from places where the grass grew thick, put it up into bales, and bring these in on the backs of ponies. Men often helped in this work. The grass sought was the prairie grass, not the red or river grasses.

The women gathered the grass at intervals as it was convenient or as they had need. The gathered store would be exhausted say, in ten days, and three more bales would be gathered and brought in. No great store was kept on hand; just two or three bales, as I have said, would be seen on the stage. Laid on the stage floor, the grass was out of reach of the dogs, for our horses did not readily eat hay that had been trampled or which dogs had fouled or run over.



Dried grass or hay was not fed to horses regularly, only when the weather was stormy or at night when enemies were about. It was an emergency feed.

We did not store cottonwood bark on the stage floor as we stored hay, for the bark would have frozen hard again even if thawed.

The women of our lodge used to go to the coulées a mile and a half away for grass; they bore the bales home on their backs or the backs of horses. The bales were bound with rawhide ropes, of which we always had an abundance.

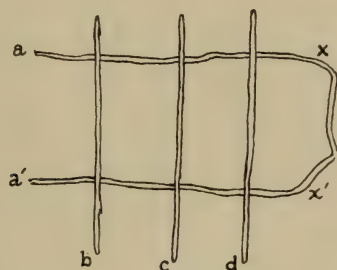


Fig. 15

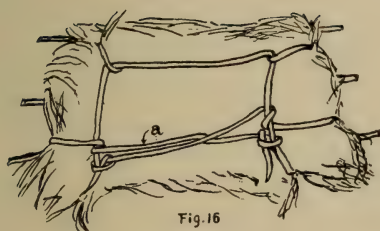


Fig. 16

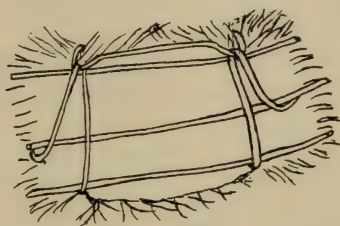


Fig. 17

Fig. 15. The Foundation for making a Bale of Grass.  $a-a'$ , a rawhide lariat;  $bcd$ , three sticks laid across the lariat.

Figs. 16-17. Obverse and Reverse of a Bale of Grass, showing Method of Tying.

Three sticks, each about three feet in length, were laid on the ground, with a rawhide lariat beneath, as in Fig. 15. Grass was cut with a hoe and heaped on the sticks,  $b$ ,  $c$ , and  $d$ , for the bale. The ends  $a$  and  $a'$  were drawn over the bale and under the lariat at  $x$  and  $x'$ , passed over the ends of the bale, drawn under the lariat on the other side, and finally fastened each to the opposite band. (See Figs. 16 and 17.) The bale when bound was about three feet long and nearly as thick. One such bale was a load for a woman; four bales were a load for a horse.

When the bales were brought in, a man, or one of the women, ascended the stage by the notched-log ladder and the bales were passed



up to her. Sometimes the bales were piled on the floor unbound; at other times the bales were unbound and a log was laid over the hay for a weight.

*Feeding Hay and Bark.* If we wanted to feed the horses both hay and bark, the hay was laid on the ground under the corral rail first and the bark laid on top of it. If our store of hay was scant, a bit only was saved for morning feed, none being fed the horses in the evening.

*Winter Pasturing.* Horses of little worth, and wild unbroken horses, were allowed to run on the prairie in winter, notwithstanding the risk that they might be stolen by enemies; but even these horses were not wholly neglected. The owner would go out every day, separate his horses from the rest of the herd, and drive them to water. Once a day was enough in winter, as the horses ate snow.

If a blizzard threatened, the owner sometimes went out and drove his horses into the woods. He would catch one of his pack horses, mount, and drive the others before him. It was not necessary to lasso the pack horse; the owner spoke to it, and being gentle and well trained, it stood still, letting the man approach and mount. Even during a storm, the owner would go out, seek his horses, bunch them up, and water and care for them.

If enemies were sighted, all the horses of the village were driven into the winter camp. A man might then stable his best horses in his earth-lodge, putting his less valuable ponies under the drying stage. I have told you how our horses were stabled under the summer corn stage.

In winter, on a fair day when the weather was good, our hunting horses were usually driven to pasture out in the hills; but if it was suspected that enemies were about, as many of the horses as possible were kept all day in the village.

*Watering the Horses.* In winter we watered our best horses twice, about noon and again before sundown. A spring was the best watering place. Sometimes we watered horses at the river, but not nearly as often as at a spring. The horses drank a greater quantity at the spring, as spring water is not so cold. The herders also preferred a spring because it did not freeze over in winter and was easy to keep open. They would deepen the runway for four or five feet into a shallow trench. This filled with water and the horses were led up to drink.

For household use we did not often seek spring water; never, if we could get Missouri River water. Many of our villagers thought the Missouri River water strengthened them and kept them in health. For winter use our women fetched water from the river or brought in ice or snow in baskets, to melt.

*Small-ankle's Narrative.* Now I will tell you how my father cared for his horses the winter we camped at Buckbrush-pit Timber.

In the morning we arose before day and breakfasted about daybreak. For breakfast we ate boiled dried meat and drank the broth. We often dropped parched corn into the cup of hot broth to soften the grain and make it easier to eat.

The horses were fed by the men almost as soon as the family were up. After breakfast, soon after sunrise, the horses that had been stabled in the lodge over night, were driven into the hills to pasture. This duty commonly fell to the young men and boys of a household, but in our lodge my father took it as his own task.

He would drive our herd into the hills, perhaps three miles from camp, and look about for a good place for pasture, kicking away the snow at places to see if the grass was thick and heavy. Finding a good place, he would kick the snow off the grass with his feet; and the horses would do likewise with their feet. My father would not hobble his horses for fear they could not scrape away the snow with their hoofs.

My father stayed out all morning with his horses. When they had grazed a while, he hunted around and if he found another place where the grass was good, he drove his horses there to graze. If left to themselves, the horses would not know where the thick grass could be found; and they would go on in the direction they were headed or drift with the wind.

Thus my father spent the morning. After satisfying himself that all was well, he would come back to the lodge a little after the noon hour, leaving his horses at their grazing place, three miles away. Later, about two or three o'clock, he would send me out to take his place and watch the horses.

In the afternoon my father would help his wives cut down a cottonwood tree and help them bring in the bark. Often he felled the tree and let the women peel off the bark; this they did more expertly than men, for it was women's part to do ax labor.

Meanwhile, as I watched the horses, I went around seeking good places for them to graze, and driving them thither. If while they grazed, I found nothing else to do, I would go around the little herd crying and weeping and praying to the horses: "You are my gods. I take good care of you. I want to own many horses in my lifetime." My father had taught me to do so, saying: "If you pray thus to your horses, you will never lack for a herd; you will have good luck and never be poor." Sometimes as I cried and wept, real tears ran down my cheeks, and

sometimes not. Whether other boys did this while herding their horses, I do not know. My father, however, taught me to pray to the horses.

About sunset I drove our horses home, arriving a little after the sun had set. I would catch one of the horses, mount, and drive the others before me. I would approach the pony I wished to mount, and holding out my hand, palm down, I would say, "*Ha<sup>n</sup>, ha<sup>n</sup>, náhadě*, So, so, stay there!" And the horse would stand still for me.

Likewise, when I drove the horses to the spring to drink, I would say, "*Hi', h'ědě*, Drink thou, drink ye!"

As I came in the evening to the lodge, I would call, "Raise the door!" Someone within, my father or one of my mothers would raise the skin door and let the horses in. I dismounted outside of the covered entrance, removed the lariat from my pony, and let him go in.

In bad weather, my father stayed out with his horses all day; or else he returned to them in the afternoon, instead of sending me, as he usually did when the weather was fair. When he stayed all day, he took no lunch with him, expecting to eat when he came home in the evening.

If a heavy storm was blowing, or a blizzard, the horses were not driven to the hills, but were kept in the lodge and fed what we had, hay or bark. However, even then, we let them run in the near-by woods to pick up what they could. They could eat wild-bean vines and ghost-whistle rushes and roseberries. The horses readily ate the berries off the tops of the rose bushes. They also ate buck-brush, or broom-brush berries; these berries turn almost black in winter. It was wiser to drive the horses into the woods on a stormy day; if left on the prairie, they were likely to drift with the storm.

Ghost-whistle rushes we thought very good feed for horses in the fall, when not frozen. In winter the rushes had ice inside of them and gave the horses diarrhoea, so that they sometimes died.

Sometimes, if there was a very bad storm, the horses were kept in the lodge all day; especially, if we had enough feed ahead to give them.

*Feeding Corn.* We fed our fast, or hunting horses a little corn, a cupful of shelled corn at a feeding. This was done both winter and summer; but not every day, only occasionally.

I have heard that hunters, when intending to chase buffaloes, would sometimes parch an ear of corn over the coals, and having broken the parched ear in three pieces, fed a piece to each of three horses. This made the horse run swiftly and strong. I never saw parched corn thus fed myself, but I know that some so fed it in my tribe.



## CARE OF HORSES ON THE WARPATH.

It was the rule in a war party that every warrior should care for his own horse. Each man carried a hard, seasoned, ash-wood pin to picket his pony, in the evening a little after dark. A lariat was attached to the ash-wood pin, the other end being tied about one of the horse's forelegs; both forelegs were first hobbled. A pony was never picketed far from the war party's camping place. The picket pin with its lariat was carried, bound to the rear of the owner's saddle, as the party traveled.

A war party did not travel fast. We would send spies ahead who would ascend some high hill to see if the way were clear. The rest of the party followed. If the spies did not return to the main party, we took it as a sign that no danger was ahead; and feeling secure, we stopped whenever we wished and rested and grazed our horses. These stops were every two or five miles, or like intervals, and at these stops and again at night our ponies grazed. The ponies were watered when we crossed a stream or passed a spring. When out with a war party, we fed our horses nothing but what they could graze.

When running from the enemy, a warrior had to urge his pony at high speed; he did not give his horse any water, not a drop. He waited until the next morning, and then let his horse drink. If he watered his pony the same day, the pony was likely to die, especially if it was a hot day. We Indians said that if a horse was run all day when the weather was hot, the animal got a "burned heart." Such a horse, until it was well rested, had to be kept tied up or hobbled to keep it from getting water, else it would die.

## PROTECTING PACK HORSES FROM MAGPIES.

Pack horses were apt to have sores on their backs where they were rubbed by the pack saddles. Indeed, nearly every pack horse had such sores. Our hunting horses were never thus troubled, for we took good care of them. In earlier times, our hunting horses were ponies, but swifter than those used for pack animals. The big horses we got later from white men were very swift, but were apt to give out after a run of three miles. Our hunting ponies were not as speedy as these white men's horses, but they had more endurance and could go all day without tiring.

Ponies with sore backs were troubled by magpies. The birds would pick at the sores with their sharp beaks, so that they did not heal. To keep the magpies away, we would tie an arrow, head down and feather up, to that part of the horse's mane that lies nearest its back.



To stay the pack saddle from slipping forward when the animal was going down hill, a thong was run back from the saddle and looped under the root of the pony's tail. This was apt to develop a sore under the tail; and this sore, also, was troubled by magpies. So an arrow was often tied to the tail also, in the same manner.

Only an arrow was used. A stick or branch tied to the horse's mane would not frighten the magpies, but an arrow did. We thought this was because an arrow had the [magic] power to do so. The arrow was without a head, just a wooden shaft sharpened to a point. It was made especially for the purpose, and nocked and feathered with three feathers as were other arrows. The feathers used were often of owl wings, which being spotted white and black, were more easily seen by the magpies. The feathers were left large; they were not trimmed narrow as were those of hunting arrows. The larger feathers more readily attracted the birds' attention.

Arrows were thus used to frighten magpies<sup>1</sup> in winter, chiefly. In summer the horses were fat and in good condition, and any sore healed quickly. In winter they were less vigorous; were perhaps, more often used; and our camp being in the woods, we were more likely to be troubled by magpies than in the summer village. But arrows were thus used in summer also.

Fig. 18 is a sketch made by Goodbird, of a pony with protecting arrows, drawn under my direction. Some careless families did not trouble to use arrows to frighten the magpies; wiser families, who took good care of their ponies, used them. A wise family might have two or three horses, each with an arrow on mane or tail.

#### HORSEGEAR.

*Bridles.* Bridles and halters were made by twisting a lariat in or about the horse's mouth. The lariat was seven or eight double arm-lengths (fathoms) long. Whether the lariat was used to make a single or double rein bridle, the free end was coiled up and inserted loosely under the belt of the rider, on the right hand side. This was of advantage to him, for if he was thrown from his horse he could seize the rein and save himself.

We observed this custom both in buffalo hunting and in battle. I never heard that the lariat was allowed to drag on the ground, in the

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<sup>1</sup>I never saw arrows used thus. In my time we bound a blanket over the horse's back to protect it from magpies—Goodbird.

hunt or battle. I should not think that a good way, for some other horse might step on the loose line and jerk the pony to a stop.

I have already described one form of bridle or halter (Fig. 4). I will now describe additional types of bridles and halters, in use when I was young.<sup>1</sup>

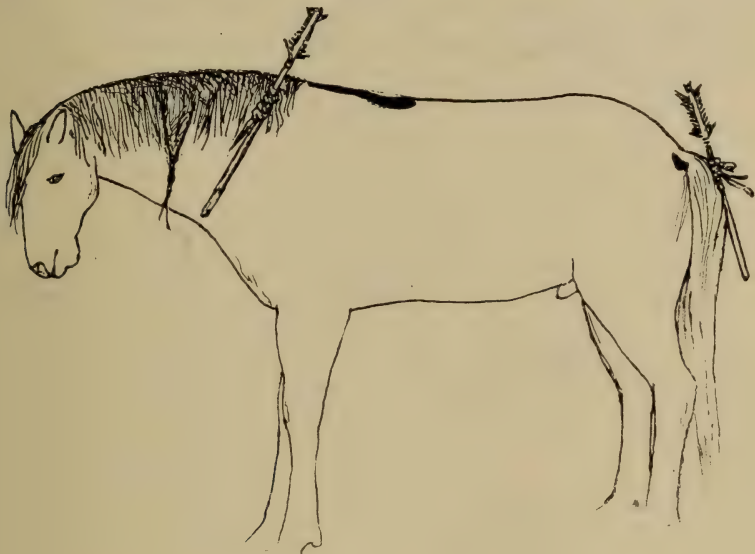


Fig. 18. Goodbird's Sketch of a Horse with feathered Arrowshafts tied to Mane and Tail as a Protection from Magpies.

Fig. 19a and b shows two bridles nearly alike, yet not quite identical. These forms were used when a little haste, but not much permanence, was needful; as, for example, in a horse race. Such a bridle, made by a single twist in the horse's mouth, was easily taken off again, and served excellently in a horse race, where it was necessary for the rider to use both reins. These two forms of bridle were not used in war. Fig. 20 illustrates another bridle, excellent for use in races.

Fig. 21 shows still another form of bridle. It was used especially for a horse with strong neck. It was a two-rein bridle; all war and buffalo-

<sup>1</sup>The diagrams in this section were made as follows:—In each case, the horse's head, with open mouth, was drawn by Goodbird. A split stick, the branch of a tree, which had some resemblance to a horse's head was rigged up on Wolf-chief's table and the bridle or halter was made with a rawhide lariat over this stick. The drawing I completed myself from this stick model. This was not difficult, as I had but to draw the outline of the bridle-tie in the horse's mouth. Even then Goodbird often helped me as his fingers were more deft with the pencil than my own.—G. L. W.

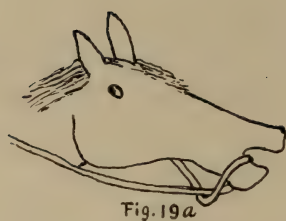


Fig. 19a



Fig. 19 b

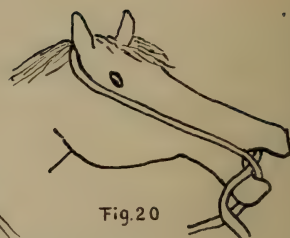


Fig. 20

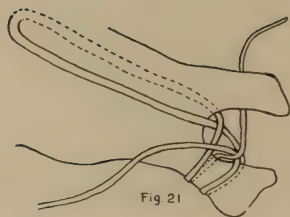


Fig 21



Fig. 22

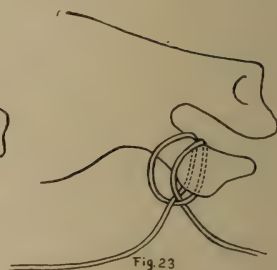
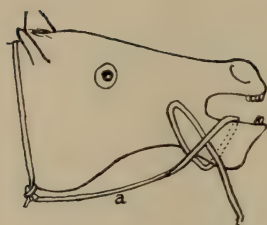
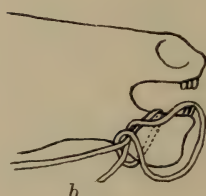


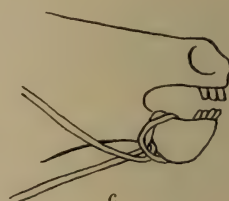
Fig. 23



a



b



c

Fig. 24.

Fig. 19. Two Forms of the Racing Bridle, made by a Single Twist of the Lariat in the Horse's Mouth.

Fig. 20. Another Type of Racing Bridle.

Fig. 21. A Two-Rein Bridle used on a Strong-Necked Horse.

Fig. 22. Bridle used on a partially broken Pony in Racing.

Fig. 23. A Makeshift Bridle.

Fig. 24. A Bridle used in Swimming and Towing Horses.

hunting bridles had two reins. I do not think this type of bridle was ever used for riding short distances. Though it could be used on a gentle horse in battle or hunt, it was chiefly used on a strong-necked horse that did not readily obey the reins.

In the diagram (Fig. 21) of this bridle, the dotted lines represent the lariat on the farther side of the horse's head. The bridle is thus formed: The lariat is carried back of the horse's ears, crossed in his mouth, one end is carried clear around the lower jaw, passed under the other end on the right hand side, and carried back through the mouth again.

Fig. 22 is a bridle given me by Goodbird; it is not one I ever saw in old times. He says it was used in horse races on a pony partially broken, which was not much accustomed to having the lariat in his mouth. The bridle was formed by making two similar loops, lying not quite alike, as shown in the diagram, and slipping them over the under jaw.

The bridle shown in Fig. 24 was used chiefly for swimming horses over the Missouri, and held the horse by both neck and jaw. A horse, so bridled, was often towed by the owner, who was in a bull-boat. This form of bridle was sometimes used when one rode horseback, if the pony was rather wild: and it often served as a halter, for leading a pony. It was not used in buffalo hunting or in war.

To make the bridle, the lariat is knotted around the horse's neck; the end is carried to the animal's mouth, passed around under the lower jaw, and looped under the rein thus formed, Fig. 24a; then the loop is drawn out and passed around over the horse's lower jaw, Fig. 24b. The completed bridle is shown in Fig. 24c.

Finally, there was a kind of makeshift bridle which was used more like a halter than a bridle. If I happened to have no lariat with me, I tied a soft hobble over the lower jaw by an ordinary double knot, Fig. 23. The knot was drawn tighter than is indicated in the diagram.

Our Hidatsa name for bridle is *i-iduti-kidúpakě*, or mouth-double-tied. A horse obeyed the bridle reins readily.

*Lariats.* I made my first lariat when I was about thirty years of age. We were hunting buffalo on the Yellowstone River, and one June day killed a cow. I took one side of the hide, saying to my brother-in-law, Son-of-a-star, "I am going to make a lariat (*iduti*)."  
My brother-in-law and I returned to camp that evening bringing the hide. The camp was quite large, for all the Indians of our Reservation took part in this hunt.

In the morning at about seven o'clock, I took the green hide a short distance from the camping place. (I was not willing to wait until the hide was dry, for I knew that dry rawhide is more difficult to work than



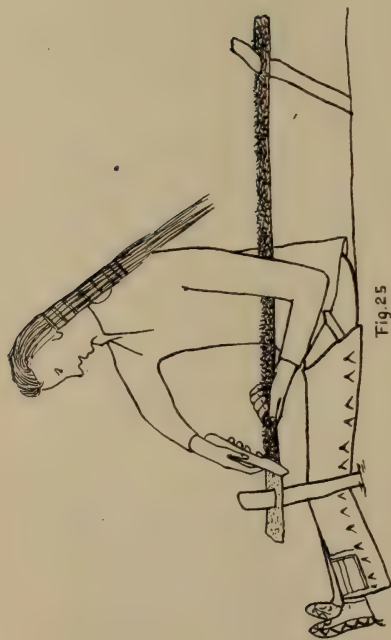


Fig. 25

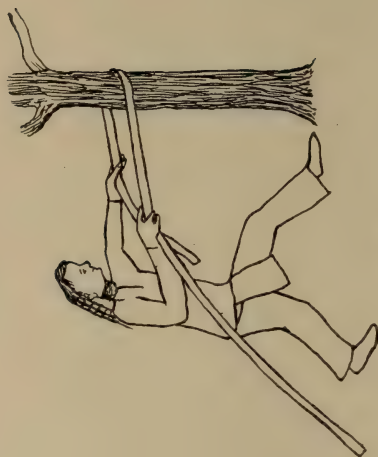


Fig. 26



Fig. 27

Fig. 28

Fig. 29

Fig. 25. Scraping the Hair from a Piece of Green Hide preparatory to making a Lariat.

Fig. 26. Softening the Hide.

Fig. 27. Another Stage in the Softening Process: Biting the Strip of Hide.

Fig. 28. The Completed Lariat.

Fig. 29. The Lariat before Trimming, looped for passing over a Horse's Head, so it may be dragged on the ground to stretch it.

green hide.) I trimmed the head and legs from the hide and cut it spirally into a long strip about four inches wide, much as you say a shoemaker cuts a shoestring from a piece of leather. The cutting of the hide was a delicate operation, for the strip had to be of uniform width. I did not get through until noon.

I went to camp for my dinner, boiled dried meat and raw marrow from the leg bones of a buffalo broken for the purpose. I ate the marrow with a stick. My hands were so tired from my morning's work, that after my dinner I went down to the river and took a bath and short swim, diving and cooling off my body, for the day was sunny and hot.

After my dinner, I cut two stakes of hard ash or juneberry wood, the diameter of a broom handle and about three feet in length. At a place twenty yards from our tipi, on the side toward the river, I staked the strip of green hide to the ground, fur side up (Fig. 25). Sitting at the right and grasping the strip with my left hand five inches from the farther stake, I began to shave the hair off the skin with my knife. A whetstone lay beside me on which I whetted my knife from time to time. As soon as I had removed the hair for about five inches, I moved backwards, and so on until the hair was all removed. I spent the whole afternoon thus, working and resting alternately.

Before leaving the strip, I greased it well on both sides, with dried fat from a buffalo's paunch. The lump of fat was slightly heated over the fire before being used. This greasing of the strip took about an hour and a half; and I left the strip for the night.

The next morning the strip had dried a little. After breakfast I began greasing it again. My friend, Took-a-gun, came over to me and said, "You are making a lariat, I see." Then he added: "You had better take it off the stakes now, for it is oiled enough. Also, it is better to hold it over a fire than to leave it in the sun, as the grease will soak in better and the lariat will not crack or break afterwards. To soften the strip you should whip it against a tree and then draw it back and forth under a rough stone on which you should stand. After that, double it and bite it with your teeth, at intervals of an inch, the whole length of the strip."

I did as Took-a-gun said. I took the strip of hide from the stakes, coiled it, and holding the coil over the fire, waved it back and forth lest the heat scorch it. It took but a short time to warm the strip and let the grease soak in; and I stretched it between the stakes again. It cooled quickly.

Then I passed the strip around the trunk of a cottonwood tree and drew it back and forth against the rough bark, as shown in Fig. 26. I coiled the strip again, and vigorously lashed it against the tree. Then I went to the river bank and got a rough stone. I passed the strip under the stone, stepped on the stone, and drew the strip back and forth under it. This done, I began to soften the strip by biting it (Fig. 27). I folded it hair side out, and bit along the edge, running it from side to side between my teeth, repeating this at intervals of about an inch. By noon I had bitten but a section of about three feet, and my jaws were weary of the labor.

For quite a while boys and girls had been standing about, watching me curiously. One-buffalo, a young man of my own age, joined them and I said to him, "I wish you would help me." "I will help you," he answered. After we had eaten our dinner, he began to work from the opposite end of the strip from where I had begun. When the strip had been bitten for its full length, we stretched it, one of us holding one end in his hands, while the other drew the strip through, doubled so that the two halves would run against each other. We also worked the flat sides, rubbing them one against the other to soften them. We completed our task about six o'clock in the evening.

I now began to sharpen my knife preparatory to trimming the edges of the strip to a uniform width, for the thin parts of the lariat had stretched narrow. As I was whetting the blade, Took-a-gun came by. "You have a good, pliable rope," he said. "What are you going to do with your knife?"

"I am going to trim off the wider parts," I answered.

"Don't do that," said Took-a-gun, "Cut a hole in your lariat a short distance from the end, slip the end through it, and insert a pin to form a loop (Fig. 28). Throw the loop over your horse's head, turn him in with the herd, and let the lariat drag for a day. Choose the horse that is the leader of your herd, so that the others following him, will be sure to step on the lariat. The strain thus put upon it will stretch it into final shape. Then you may trim your lariat with safety, knowing that it will not stretch narrow in any part again."

The leader of our herd was a black horse. I put the lariat around his neck the next morning as Took-a-gun bade me. I purposely chased the horse around all day. In the afternoon, when I watered the horses, I took off the lariat while the black horse was drinking, but put it on again. Not until evening did I remove the lariat. It was white, and on the surface was evenly rough, like a file, where the teeth marks were.

I now trimmed the lariat very carefully to a uniform width. This was not more than the width of my two fingers, and was about half that of the green strip as I first staked it out. I fastened an iron ring at one end, by slipping the lariat through an aperture cut in the end, the latter being first slipped through the ring (Fig. 29). The noose was made by passing the lariat through the ring. When I made a bridle of my lariat, I always made it with the ring end of the rope.

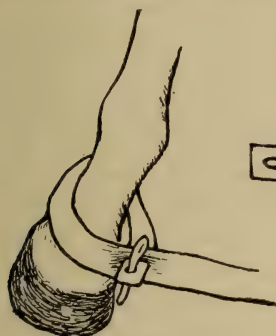


Fig. 30



Fig. 31



Fig. 32

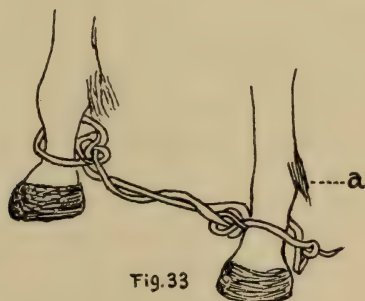


Fig. 33

Fig. 30. Rawhide Hobble fastened with a Wooden Pin.

Fig. 31. A Hobble for Two Feet, tied only around One.

Fig. 32. Looped Ends (x and y) of Soft Tent Skin Hobble through which other Hobbles are passed to be carried.

Fig. 33. Method of Tying a Hobble of Soft Tent Skin. To prevent chafing, it is always tied below the joint at a.

*Hobbles.* In olden times, we used hobbles a great deal. A good hobble was made of a strip of rawhide about the width of my first three fingers. A slit was cut in one end; a second slit was cut a little farther back, at a distance permitting the part toward the end to go around the horse's ankle. The slit end was then drawn through the second slit and



anchored with a wooden pin (Fig. 30). The other end of the hobble was slit in the same way so that both fore feet of the pony could be enclosed. When thus hobbled together, the horse's fore feet should be about fifteen inches apart. If the feet were bound too close together, a horse could move rather rapidly by lifting both feet at once in a kind of gallop; but if his fore feet were bound about fifteen inches apart, the horse would instinctively use but one foot at a time, and could not go very rapidly. This kind of hobble was called *itsi-iduti-aku-mida-ikatipě*, foot-tie-of-wood-pin, or wooden-pin foot-tie. Sometimes when a horse was in the field, it was desired to free him from the hobble, which, however, might be tied again later in the day. In that case, the hobble was removed from one foot and wrapped around the other, fastened as shown in Fig. 31.

Another kind of hobble, called *itsi-iduti-aku-aticia* or old-tent-skin-foot-tie, was made of a strip of soft tent skin about two fingers wide. It was tied around one foot just below the joint with a simple double knot, and the two ends were twisted and tied again around the other foot (Fig. 33). Neither form of hobble was ever bound about the horse's foot above the joint (*a*) because the horse would then be likely to chafe his skin.

When I drove my horses to water, I gathered up four or five pairs of hobbles of the first-mentioned kind. When I took them off the horses, I put the pins back as if they were still on the horses' legs, making loops as in Fig. 30. It was always my custom to keep one horse hobbled with a soft tent skin hobble. This last I untied, resolving it into a long thong which I passed through both loops (*x* and *y*, Fig. 32) of each of the other hobbles, and then tied the thong around my horse's neck for safety. I did not put the thong through only one of the loops, as for example, *x*, because the other loop, hanging down, might be steeped upon by the horse and he might be injured.

*Saddles.*<sup>1</sup> Excepting the short account below, no good description was obtained of the making of saddles. From casual references by Wolf-chief to the form and use of saddles by the Hidatsa, the following was gleaned:

There were two forms. The hunting or racing saddle was a pad of soft skin stuffed with antelope hair; even this was usually dispensed with in battle. A specimen of the Hidatsa racing saddle is in the Museum, and the writer photographed a pony with such a saddle, as the animal stood hitched before Wolf-chief's cabin. Fig. 34*a* is a tracing from this photograph.

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<sup>1</sup>See pp. 280, and 299.

The horn saddle described below is spoken of as a "woman's saddle" or a "pack saddle." A buffalo hunter saddled his hunting horse with the pad, or hunting saddle, putting horn saddles on the pack horses which he took along to bring back the meat. A beautiful specimen of the latter form of saddle, covered with a painted parfleche, was purchased of Wounded-face and sent to the Museum. Saddles were also made with wooden frames, presumably shaped like those with horn frames.

In 1915 Wolf-chief gave details as to the making of deer-horn saddles, which, for the sake of completeness, are reported here:—

When deer-horns are collected they are found to vary considerably in shape; some are straighter than others and many are more or less irregular. The kind that curves over in a half circle were always sought for saddle bows. If a man found one, or took it from a deer he killed, he saved it. If from a slain deer, he removed it by chopping around the root of the horn with his knife and breaking it off. The prongs or tines were chopped and broken off in the same way, but sometimes they were broken off with a stone and the irregularities of the stump smoothed out with a knife. It was not easy to get a perfect antler as they were apt to show all kinds of crooks.

When the horn was reduced to a mere bow, the ends were bevelled and three grooves cut on the outer surface, but not under. This was for the forward bow of the saddle which was nearly upright. The rear bow which curved slightly inward was cut in a similar manner, but shorter.

Then two cottonwood boards were cut for the sides and lashed to the bows. The ends of the bows were bound down to the boards with green thongs drawn through three holes and around the three grooves on the ends of the horn bows. The horn bows were covered with a strip of green hide sewed beneath with sinews. The boards also were covered with green hide and sewed with sinew on the under side. (Fig. 35 *a*.)

A strip of green hide was next swung between the two horn bows, to sit upon. The saddle was held to the fire or in the sun and when it was slightly dry, the hide was smoothed, polished and worked with a small stone. Thus, alternately dried, by fire or the sun, and worked with a stone, the strip did not shrink when finished. Such a saddle was excellent; one could load the meat of a whole buffalo on a well-made horn saddle.<sup>1</sup>

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<sup>1</sup>A similar saddle is described by Bradbury, *ibid.*, 128-129.

"... The favorite buffalo-horse trots along loose, carrying only a light skin pad stuffed with deer or antelope hair. The hunter rides one of his pack-horses, in order that his 'runner' may be fresh for the severe labor of the chase." (Boller, *ibid.*, 225.)

*Saddle Skins.* Skins were placed under a horn saddle to keep it from galling a horse's back. One saddle skin, laid fur side down, was used if the horse bore only his rider. If a heavy load was packed on the animal's back, four or five saddle skins, or half a folded tent skin,



Fig. 34.

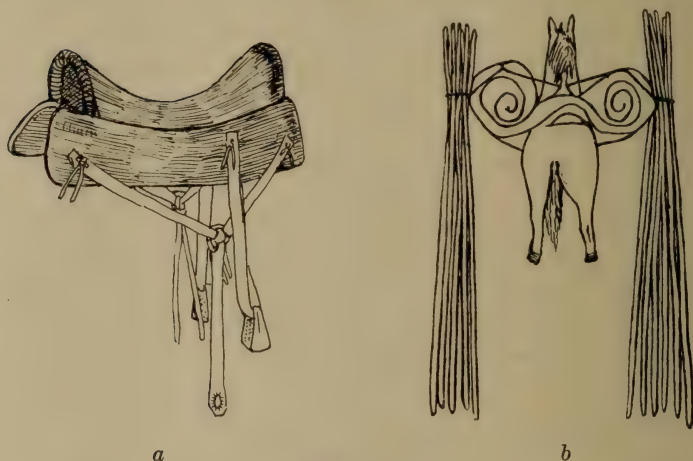


Fig. 35.

Fig. 34. *a*, Pad or Racing Saddle; *b*, Flaying a Buffalo preliminary to Preparation of a Saddle Skin.

Fig. 35. *a*, Pack Saddle with Deer Horn Frame; *b*, Transporting a Tipi Cover and Poles.

was used. The name for saddle skin is *edipu-dáxukě-ódaxpi*, or belly-saddle-skin. Such a skin had short hair, as the hair on a buffalo's belly is always short. A saddle skin was thus taken. When a buffalo had been killed, it was turned over on its back, legs in air, and stayed in this position by turning the head to one side, letting it lie on one cheek



with horn to the ground (Fig. 34*b*). The belly skin was then easily removed. A yearling or a two-year-old buffalo was thus flayed, or a cow also, if the whole hide was wanted for a tent skin.

*Carrying Tipi Poles.* In olden times, tipis were transported sometimes by dogs, sometimes by horses. When a pony was used, six poles were bound on one side of the animal, and six on the other. About two feet from the smaller end of each pole, a hole was burned, through which the tying thong was passed. These holes were burned with a red hot piece of iron, about the size of a lead pencil. Before we got iron, instead of holes, I think we must have made grooves around the poles. I think this was the custom, because some people did so even in my own time. The groove was cut just deep enough to receive the thong. To tie each group of poles, the thong was passed within this groove around the first pole, then around the second pole, and so on. They were then bound together simply by tying the two ends of the thong. The tying for both grooved and perforated poles was the same.

A sort of makeshift travois was sometimes made by binding sticks or wooden bars transversely across the two bundles of tipi poles, at the place where a travois basket would ordinarily be bound to the frame of a horse travois. In this case, the poles were bound together in a cylindrical bundle on each side of the horse, while ordinarily they were let drag loosely and spread out behind fan-fashion. On a makeshift travois of this type, a light load could be placed; but never a heavy burden, that would spring the poles and make them crooked. Good tipi poles were of poplar, which was difficult to get. Cottonwood poles which we could cut on the reservation, we thought not so good.

The tipi cover was often loaded upon the horse's back. Fig. 35*b* is a rude diagram made by Goodbird, to show how a tipi was carried. The cover was rolled up and slung over the pony's saddle, half on one side and half on the other. The two bunches of tipi poles were bound to the outside of the tent and allowed to drag on the ground, as shown in the diagram. They were more easily dragged thus, bound to the outside of the folded cover.

A pony thus laden with tipi cover and poles was led by one of the women of the family when on the march. Sometimes the woman rode ahead on a pony and led the pack animal; sometimes she walked beside him, leading him; but he was always led, a rope being thrown about his neck for the purpose. The woman had to be careful that no pony following her own stepped on the ends of her poles and injured them.



On the march, a woman might also carry a light load, as two or three blankets or a robe. Such a load she carried on her back with her pack strap, which had both a shoulder and a forehead band. Though the headband was not generally used, it was of help sometimes, as when the woman wished to rest her shoulders. If the headband was kept constantly in place, it would fret the skin of the woman's forehead.

*The Travois.* For a description of this apparatus and its use see the account of a hunting party traveling with horses, mules, and dogs (pp. 275-276, 280).

#### NAMES FOR HORSES.

*Our Family Herd.* At the time when I began to herd horses, our family owned about a dozen. There were three mares, which had no names as I recollect; one was a yearling and another a two-year-old. Two of the herd were fast horses, good runners and used only for buffalo hunting and chasing enemies; and four were working horses. These four and the two fast horses were geldings. Some of the working horses were very slow and lazy. We had also one stallion; he was a gentle horse, used both for riding and working.

We named horses for their peculiarities, their color, marks upon the body, or the like. I will now try to give you the names of those of our family herd, with the meanings. Our two fast horses were called:—

Tsítataki-itsúwuckac, or Deer-horse; so named because on the hunt he could overtake a deer or antelope.

Édatakic, or White-belly; from *édi*, belly, and *atáki*, white; so called because he had a white belly.

The four work geldings were called:—

Tsítanëxic, or White-tail.

Tisdi-cëpic, or Dark-bay.

Tsadic, or Light-bay.

Cípicëc, or Black.

The stallion, we called Núwakečc. We always called the stallion of the herd by this name. The word means "stallion," but we used it like a proper name.

Besides the foregoing, we had a big mare that we called *Mika-akú-i'tiác*, or Female-that-is-big. This term we used about the same as a proper name; it may be translated, Big-mare.

*Other Names.* I will now give you the names of some of the village horses as I remember them:—

Naáxpíhě-atákie, or White-mane (Mane-white).

Itsúwucka-aku-ita-tákie, or Horse-with-face-white.

Itsúwucka-aku-íxidu-atákie, or Horse-with-forehead-white.

Other names in English are as follows:—

|                              |                    |
|------------------------------|--------------------|
| Split-ears                   | White-ears         |
| Dark-face                    | Thin-face          |
| Yellow                       | Big-belly          |
| Long-hoof                    | Red-ears           |
| Big-ankle                    | White-tailed-grey  |
| Thin-bay                     | Spotted-one        |
| No-ears                      | Yellow-spotted-one |
| Long-ears                    | White-spotted-one  |
| Horse-that-runs-in-two-gaits | Blackie            |
| Bob-tail                     | Black-spotted-one  |
| Much-mane                    | Red                |
| Gentle-horse                 | Red-spotted        |
| Broncho                      |                    |

*Age Names.* Certain terms denoting a horse's various ages, we used almost as if they were proper names.

Thus, we called an old mare Míka-aku-xíěc, or Female-that-is-old. A colt under a year old we called Awa-hida-nákac or Year-new-youngling; we may perhaps translate, New-year-youngling or One-year-youngling. A colt in his second year we called Awa-íkupa-nákac or Year-second-youngling. A two year old colt, one that had completed two years, or two winters, we called Ita-wáda-dupác or His-winters-two (or His-winters-are-two).

These were not, strictly speaking, names, as we did not use them in addressing the horses. We did use them in speaking to one another in the lodge, and everyone recognized the terms, or names, as belonging to particular animals. However, horses did not learn to know their names as did dogs, nor do I think they are as intelligent as dogs.

## DOG CULTURE.

The best systematic study of the Indian dog is the recent paper of Glover M. Allen, *Dogs of the American Aborigines*.<sup>1</sup> Among others this author distinguishes two types of dog for the Missouri country, the Plains-Indian dog and the Sioux dog. To quote:—

*Characters*.—Size medium, slightly smaller than the Eskimo Dog; ears large, erect; tail drooping or slightly upcurved; coat rather rough, usually 'ochreous tawny' or 'whitish tawny,' or sometimes black and gray, mixed with white.

*Distribution*.—Western North America from British Columbia south perhaps to the Mexican Boundary and eastward through the Great Plains Region.

*Notes and Descriptions*.—It is apparently to this dog that most of Lord's description (1866, 2, p. 222) applies in his *Naturalist in Vancouver Island and British Columbia*. So impressed was he by the general similarity of these dogs to coyotes, that he believed the one derived from the other, and makes one general description do for both, with the addition that in the dog the hair "becomes shorter, softer, and more uniform in coloration, although the tail retains its bushy appearance." The general color is an "ochreous gray," the hairs tipped with black, those of the neck tricolored, having their "lower two-thirds reddish brown; then a ring of white, and a black tip." This pattern gives "a most curious speckled look" to the bristling neck of an enraged dog. Coues (1873) was equally impressed by the general resemblance of these dogs of the Plains Indians to coyotes, and considered the two animals essentially the same in structural points, though he thought it "unnecessary to compare the skulls." Indeed, he accepted it as unquestionable that in every Indian community mongrel dogs are found, shading into coyotes in every degree."<sup>2</sup>

### The Sioux dog:—

*Characters*.—A large wolf-like dog, probably closely related to the Plains-Indian Dog but larger and gray rather than tawny in color.

*Distribution*.—Probably the north-central plains area, from the Missouri north perhaps to Saskatchewan.

*Notes*.—No doubt the carrier-dogs differed slightly among the various tribes of Plains Indians covering the wide stretch of country from Northern Mexico to Saskatchewan, so that local breeds of the general type could be distinguished did we have opportunity to compare them. Morton (1851), who tried to obtain information from frontier officers in the earlier half of the last century, quotes a letter from H. H. Sibley, a correspondent in Minnesota, who avers that "the Indian Dog differs much in size and appearance among different tribes" but that they all have small, sharp, erect ears. He particularly recalls that "among the Sioux, it is large and gray, resembling the Buffalo Wolf." Packard (1855) has mentioned "whitish tawny". . . .

Figures probably representing this dog, are shown in some of the plates of Catlin's *Indians* (1841, colored edition, 2) small to be sure, but showing the gray

<sup>1</sup>*Bulletin, Museum of Comparative Zoology at Harvard College, in Cambridge*, vol. 63, no. 9, Cambridge, 1920.

<sup>2</sup>Allen, *ibid.*, 449.

coloring, large erect ears, and scimitar-shaped tail carried out behind. His Plate 103 in 2 is a spirited drawing illustrating a dog-fight in which all the dogs of the party, though burdened with their loads "*en travois*" are rushing to participate.<sup>1</sup>

If the ideas of our informants are to be credited, the Hidatsa dog was approximately of the Sioux type (pp. 197, 204, 212, 213).

Maximilian says of the Sioux dogs:—

. . . Smaller articles were conveyed by the dogs. . . . The dogs, whose flesh is eaten by the Sioux, are equally valuable to the Indians. In shape they differ very little from the wolf, and are equally large and strong. Some are of the real wolf colour; others black, white, or spotted with black and white, and differing only by the tail being rather more turned up. Their voice is not a proper barking, but a howl, like that of the wolf, and they partly descend from wolves, which approach the Indian huts, even in the daytime, and mix with the dogs.<sup>2</sup>

. . . A great number of Indians' dogs surrounded this village, which did not differ from those we have already described. Many of them were perfectly similar to the wolf in form, size, and colour; they did not bark, but showed their teeth when any one approached them.<sup>3</sup>

On the other hand, Maximilian seems to distinguish between the Hidatsa dog and the Sioux type, as:—

. . . When they quit their huts for a longer period than usual, they load their dogs with the baggage, which is drawn in small sledges, made of a couple of thin, narrow boards, nine or ten feet in length, fastened together with leather straps, and with four cross-pieces, by way of giving them firmness. Leather straps are attached in front, and drawn either by men or dogs. The load is fastened to the sledge by straps. . . . The Mandans and Manitaris have not, by any means, so many dogs as the Assiniboinis, Crows, and Blackfeet. They are rarely of the true wolf's color, but generally black, or white, or else spotted with black and white. Among the nations further to the north-west they more nearly resemble the wolf, but here they are more like the prairie wolf (*Canis latrans*). We likewise found, among these animals, a brown race, descended from European points, hence the genuine bark of the dog is more frequently heard here, whereas among the western nations they only howl. The Indian dogs are worked very hard, have hard blows, and hard fare; in fact, they are treated just as this fine animal is treated among the Esquimaux.<sup>4</sup>

Brackenridge, who resided for a time with the Arikara, close neighbors of the Hidatsa, gives the following:—

The dogs, of which each family has thirty or forty, pretended to make a show of fierceness, but on the least threat, ran off. They are of different sizes and colors. A number are fattened on purpose to eat, others are used for drawing their baggage. It is nothing more than the domesticated wolf. In wandering through the prairies, I have often mistaken wolves for Indian dogs. The larger kind has long curly hair, and resembles the shepherd dog. There is the same diversity amongst the wolves of this country. They may be more properly said to howl, than bark.<sup>5</sup>

<sup>1</sup>Allen, *ibid.*, 455.

<sup>2</sup>Maximilian, *ibid.*, vol. 1, 316.

<sup>3</sup>Maximilian, *ibid.*, vol. 1, 318.

<sup>4</sup>Maximilian, *ibid.*, vol. 2, 273.

<sup>5</sup>Brackenridge, H. M., *Journal of a Voyage up the River Missouri; performed in 1811* (Baltimore, 1816), 141-142.



Unfortunately the early artists, Catlin and Bodmer, have not given us good pictures of dogs; we note, however, a sketch by Kurz.<sup>1</sup>

The above observations were made a few years before the birth of the author's oldest informant and make it clear that even then, the aboriginal breed was well on the road to extinction. In any case, these statements fully confirm the words of an informant, "We have none of the old pure breed left on the Reservation."

#### ORIGIN.

In August, 1913, Wolf-chief, an Hidatsa born about 1849, related the following tradition concerning the origin of dogs:—

My father once told me the story of how dogs began, but I do not remember it very well. There was once a man named Yellow-dog whose medicine, mystery, or supernatural power, was a dog. You know that in old times every Indian had a protecting power, supernatural influence, or "medicine" as white men call it. Yellow-dog's medicine was a dog. His father was a wolf. As the story of Yellow-dog relates that the wolf was red-chested, it was evidently a supernatural wolf, for there are no wolves that have red chests naturally.

All the colors seen on the squashes in our native gardens were to be found on the dogs we had in the old times. They were yellow-chested, spotted, brown, and of other colors.

The mother of Yellow-dog, was an Indian woman, an Hidatsa. I do not know how she came to marry the red-chested wolf. Yellow-dog also had supernatural power from an eagle and when the Sun's wife was in the village Yellow-dog got after her.

There were four dogs: Ixi-tsë'c, or Forehead-raised, meaning that the dog's forehead did not lie flat, but was convex and swelled outward like a lump; Áti-këéc, or Lodge-digger; Mawákua-naxpic, or That-hung-high-catch-with-the-mouth (so named because he could jump high and catch drying meat on a high rack) or High-catcher; and Icta-dópac, or Eyes-four. This last we may translate, I think, Four-eyes. This dog was so called because he had small dark spots over the eyes that made him look as if he had four eyes. He was very gentle.

The story goes that all our squashes obtained their colors from dogs. Some squashes are pure white and others have the same colors as our old

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<sup>1</sup>Kurz, Friedrich, *Aus dem Tagebuch des Malers Friedrich Kurz über seinen Aufenthalt bei den Missouri-Indianern, 1848-1852. Bearbeitet und mitgeteilt von dem Neffen des Malers, Dr. Emil Kurz* (Bern, 1896).

breed of dogs. But as I say, I do not know how they increased, or how the dogs got their colors.

Yellow-dog taught our people about dogs. "That dog, High-catcher," he said, "jumps up and seizes meat on the drying stage. If you do not like him because he leaps up and steals your meat, kill him.<sup>1</sup> That dog, Forehead-raised, has a bad temper and is surly. If you do not like this, kill him. You may also kill, Lodge-digger, for he, also is a bad dog. When he digs into the earth roof at the foot of the lean-to poles on the outside of the lodge, it is a sign that someone within the lodge is going to die or that enemies or Sioux will kill somebody. But do not kill gentle dogs like Four-eyes. Dogs are magic friends. They have mystery power. When I die I shall go up in the sky; the village dogs will call to me early in the morning, about daylight, like coyotes and again at noon; and in the evening they will howl and bark at me."

We did as Yellow-dog told us. In my own day, I know that it was a rule to kill any dog that dug outside at the foot of the earth-lodge roof. We also killed any dog that was surly, but we kept the dogs that were gentle and did not steal.

#### BUFFALO-BIRD-WOMAN'S NARRATIVE.

In August, 1913, the following statements were made by Buffalo-bird-woman, an Hidatsa, born about 1840:—

#### THE PUPPY.

Dogs bred at any time of the year. As we Indians knew, gestation lasted for two months. As soon as we noticed that a bitch was gravid we were careful not to put a travois on her or kick her abdomen or otherwise hurt her, lest her young be injured. Some bitches were very surly and cross when gravid; others were always gentle, whether gravid or not.

Usually, there were from seven to ten puppies in a litter. As we wanted only big dogs, and those of the first litter never grew large, we always killed them, sparing not even one. From the second litter, we kept three or four of the puppies with large heads, wide faces, and big legs, for we knew they would be big dogs; the rest we killed.

In order that the mother might stay in good condition, we never saved more than three or four puppies out of any litter. When there were

<sup>1</sup>"Those invaluable but greatly abused members of the community, the dogs, take advantage of the temporary inattention of the women to prowl among the lodges, in hopes of being able to steal something edible. . . . The disturbance, however slight, is sufficient to draw the attention of one of the squaws, who picks up whatever comes first to hand, be it a billet of wood, a kettle, or an axe, and hurls it at the assembly with the complimentary remark 'Nar-har-ah-suk-kuk,' (Go away, you fools,) which advice is promptly heeded." (Boller, *ibid.*, 68-69.)

too many to nurse, the mother became poor in flesh, very often grew weak and sometimes died. Of the three or four puppies saved, we might choose one bitch and the rest males.

Sometimes a neighbor might ask that a puppy be kept for him. In that case one of those we had intended to kill was left alive with the rest. We always gave such a puppy as a gift and never expected anything in return.

Puppies were born blind, but after four nights, their eyes opened. When ten days old, their teeth appeared. At this time the neighbor for whom one of the puppies might be saved would come to the lodge for it, for it was now old enough to be given away.

After they were ten days old, puppies began to eat food that we gave them; but before we fed them, we smoked them. We burned some of the larger kind of sage on some coals, and I, or someone of the family, held a puppy with his head in the sage smoke (Fig. 36*a*) until white saliva, like soapsuds, dribbled from his mouth. Then I took the puppy from the smoke. Lifting him up, I said, "I want to test this dog to see if he will carry a tent" and then let him drop a few inches to the ground. If the dog fell over, I knew he would not grow up strong, but if he held his place and did not fall, I would say, "Hey! hey! this dog will carry my tent." Smoking the puppy was good for him; it gave him a good appetite so that he ate anything and everything, with no worms in his intestines.

For food for the puppies we cut any kind of meat into small pieces and boiled it. After a meal, scraps of cooked meat were cut up and given to them. We would not give puppies raw meat, because if we did, they would have worms. This rule applied only to puppies; to old dogs we gave either raw or cooked meat. Puppies should be fed often so as to keep them fat and make them grow big.

When a puppy was ten days old, his teeth appeared, growing sharper and sharper every day. Very soon he began to bite his mother's teats; then she would grow restless and wean him. As a puppy grew up he sometimes developed a surly disposition. He would bite and snap at people or fight other dogs. Such a dog was killed. Sometimes the owner would kill him with the blow of a stick or he would ask some young man to shoot him with a gun or arrows. We never ate the body of a dead dog nor saved the hide. The carcass was taken down to the Missouri River and thrown over the bank.



Wolf-chief adds the following note:—

The last born of a litter of puppies was always the smallest and was named Nákaka, or, "Last One." The word *nákaka*, was always used in referring to the last born; even in a family of children the smallest was called *Nákaka*.

#### CASTRATION.

Male dogs were castrated to make them gentle and keep them fat. Uncastrated dogs were apt to be surly and would run away with other dogs that came around the lodge. A dog was castrated when about a year old; but if fat and in good condition, he might be castrated much earlier; but the year age was the rule. It was not necessary to castrate sooner, because dogs did not breed until they were about a year old.

My aunt's husband, Blacks-his-shield always castrated the dogs of our family. Because he was our relative, he made no charge for doing this; if any other family hired him, they had to give him a big dinner.

The dog was muzzled by a thong bound about his jaws; his forelegs were bound together; and a thong was passed around his body and over his forelegs. A robe was thrown over him and his hind legs held firmly by an assistant while the castrator worked, opening the skin of the scrotum and pulling the testicle from the dog's body, without cutting it.

Wolf-chief adds the following supplementary data:—

To castrate puppies two men wrought together. One, sitting on the ground, legs apart, held the puppy by its legs, with its back to the ground, one foreleg and one hind leg in each hand, and the puppy's head toward him; the other, the castrator, cut out the scrotum with a knife and drew out the stone in its sack. The inner sack was also cut open and the stone pulled out with the white muscle to which it was attached and which was an inch or two long. This was drawn out, not cut off. During the operation the puppy howled, but was too young to bite or otherwise injure the operators. One of the male puppies of a litter might be saved uncastrated, for breeding, if the owner had need.

#### FEEDING.

As dogs became adult we fed them meat and also cooked corn for them, boiling it into a kind of mush. Anything that turned sour in the lodge, like boiled corn, we gave to the dogs. Any food that was spoiled or for some reason was rejected by the family, was set aside for them. If, on the hunt, an animal was killed that was lean and poor in flesh, it was given to the dogs. A man who killed a buffalo, saved the parts that he did not want for himself and gave them to the dogs. Sometimes he would gather up for his dogs the cast-away pieces of another man's butchering.

The tough outside part of a buffalo's ham was stripped off for the dogs, while the meat near the bone was kept. The parts of the leg below



the knee were also thrown away or given to the dogs. When buffalo were abundant, the hunters kept only the best parts, for when two or three buffalo were killed not all the meat could be carried home. The next day after the killing anyone who wished meat for his dogs could go to the place where the carcasses were butchered and get the cast-away pieces.

In times of scarcity the people cared for their dogs as best they could. They ate the bones that were crushed and broken in cooking and then thrown away. The dogs could chew and gnaw at them and get some food in this way.

#### KENNELS.<sup>1</sup>

Ordinarily, if the weather was warm, dogs slept outside of the lodge. If the weather was windy, they usually huddled down on the ground on the lee side of the covered entrance to the door of the earth-lodge. They also very commonly lay on the roof of the covered entrance or on the flat part of the roof of the lodge that surrounded the smoke-hole. Our village was rather crowded and the roofs of the lodges were used by both men and dogs as lounging places, so that one often saw dogs sitting or lying on them. If the night were quite cold, dogs might be permitted inside of the lodge, in the rear beyond the fire; but usually the dogs were kept out of the lodge.

When a bitch was about to litter, a kennel about three and one half feet high, with a circular floor about four feet in diameter, was often built. Poles were united at the top as for a tipi and grass spread over this framework. Then a few small logs were leaned against the grass to hold it down. No earth covering was thrown over it. The floor inside was bedded down with grass, but it was not dug out. Fig. 36*b* was drawn by my son, Goodbird, under my direction, to show one of these kennels. The door, which was closed by leaning a short plank over it, had a kind of lintel or cross piece above it with small logs leaning against it. Kennels like this were used only for housing a bitch and her puppies. Old dogs had no need for it.

Some of the lodges in the village were roofed with loose earth dug out of pits nearby and not with sod. To make a dog kennel, some of the families who lived on the edge of the village sought one of these pits made by digging earth for the roof and leaned sticks against the wall of the pit, leaving a place for the door. The frame thus made was covered with grass and logs laid against it, as in the case of the kennel described above

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<sup>1</sup>See p. 244.

(Fig. 36b). Fig. 36 is a sketch by Goodbird, after my description, which conveys a fairly accurate idea of the frame of one of these kennels. It will be noticed that it has a lintel or cross piece like that described in Fig. 36b. Besides these kennels, I have also seen one or two made like Fig. 36c, but with earth thrown over the grass like the roof of an earth-lodge.<sup>1</sup>



Fig. 36. *a*, Holding a Puppy over the Smoke before its First Feeding; *b*, A Dog Kennel; *c*, Sketch of the Frame of a Second Type of Kennel made by placing Sticks along the Walls of a Pit and leaving a Place for an Entrance.



Fig. 37. Wolf-chief's Model of a Frame of a Puppy Kennel. Drawn from a photograph by F. N. Wilson.

Wolf-chief gives the following supplementary information:—

When a litter of puppies was expected to be born, a kennel was prepared for them. A pit five or six feet in diameter and about a foot and a half or two feet deep was dug. Across the center was laid a log as for the ridge pole of a cabin roof and against this were laid split planks. These planks were covered with earth and grass like an earth-lodge, but with a space left for the door. The pit was dug deep enough so that small

<sup>1</sup>For shelter on the hunt, see p. 244-245.

puppies could not climb out. In cold weather or when it rained, the door was covered with an old skin, which was weighted down with an old log or a heavy stick. I have made a model of the frame of such a kennel (Fig. 37).

### THE VILLAGE DOGS.

We did not like to keep too many dogs around as they made everything dirty; and, as I have said, we gave away or killed the puppies we did not want.<sup>1</sup> In very old times I never knew a dog to be sold, though later, our customs changed, and dogs were purchased for the feast at war dances. Young puppies were usually killed by dashing them against the ground; sometimes this was done by boys, sometimes by women.

I never knew anyone to pen up a bitch to prevent breeding. As nearly as I can recollect, we expected our bitch to litter once a summer. I do not know how many times she could have littered during the year.

We had but one breed of dogs in the village in old times, but the colors of the dogs varied greatly.<sup>2</sup> We have none of the old pure breed left on the Reservation of which I know. White men's dogs have mixed with ours so that the old pure-blooded breed has been lost. Our old breed of dogs all had straight wide faces, heavy, but not short legs, and ears that stood erect like those of a coyote. The dogs were about the size of a wolf. Their hair was not very long and lay smooth and silky over the body. Our old Indian dogs had tails in general rather shorter and not so bushy as those I now see on the Reservation; and their tails curved upward somewhat at the end, not like a coyote's which lies straight.

Early in the night, about nine o'clock, before we were ready for bed, some dog was sure to begin barking or howling, "Wu-wu-wu!" and was soon joined by all the other dogs in the village, even the puppies.<sup>3</sup> However, they did not bark very long. Again, the barking was almost certain

<sup>1</sup>In 1914 the narrator said that some households had as many as twenty dogs, but that this was regarded as a very large number.

<sup>2</sup>One year later, Buffalo-bird-woman made the following statement:—

Some of our dogs were pure black, some white, some blue (iron-grey?), some red, and some spotted with every color. The majority of our dogs were spotted; there were only a few of one color. Some of our dogs were shaggy; some had short tails. A bitch might litter and have two puppies that would grow up with short tails about two and one-half inches long, while the rest of the litter might have bushy tails. Dogs with shaggy faces were apt to be mean and fight and be surly and cross.

All our dogs were about the same size. We had no small-sized dogs as we have now. All these dogs were, of course, of the old breed, which is now about extinct. There are a few of what we called "Four Eyes," the kind with spots over their eyes, but I do not know of any pure-blooded example of the old breed now left. There is one which Butterfly says is of the old "Four Eyes" variety at Mrs. Packs-wolf's cabin.

<sup>3</sup>In 1914 the narrator stated that: Dogs barked at all times, so I do not know whether our village was ever warned of the approach of enemies by the barking of dogs or not. But the dogs of our enemies were different. We knew they would bark at us if we came near their camp. For that reason a man starting on a war party should not eat the entrails taken from near a game animal's backbone; if he ate these, the enemy dogs would be sure to announce his approach by barking.



to be repeated about midnight and a third time just before daylight.<sup>1</sup> If any dog in the village set up an outcry during the day, the rest were sure to join.

When hunters returned with meat, someone on the lookout would spy them and cry out, "Hída-ě'! Hída-ě'! Hída-ě'!" At once, all the dogs knowing what the cry meant, would join in with "Wu-u-u-u!", for the dogs, too, rejoiced at the prospect of meat. Our dogs barked just like white men's dogs.

A stranger coming to an earth-lodge would be beset by the dogs belonging there and probably also by the dogs of the neighboring lodges. The dogs contented themselves with barking; they did not bite.<sup>2</sup>

A Sioux who came to our village to steal horses at night would very likely be detected by the dogs, I think, but in my lifetime I never knew of the village dogs announcing the discovery of enemies by barking. We always had men in the village on the lookout. If an enemy were discovered, as sometimes happened, from some roof in the village, the men would call out, "Ahahúts, they come against us!" Then all the dogs would join in the hubbub too. There were always men watching on the roofs. Early in the morning they ascended the roofs and looked around over the hills and over their horses to see if all were well.

We were always careful not to approach too closely to our neighbors' dogs when they were nursing. All-blossom was once bitten by a dog on the calf of her right leg. The dog came behind her, caught her, and held on, tearing the flesh of the leg open. That is the way our dogs bite.<sup>3</sup> This happened at old Fort Berthold or Like-a-fish-hook-village. All-blossom is now about sixty. She was then a young woman and married. The dog had young and she went too close to her.

<sup>1</sup>" . . . The mournful howl of a dog, mounted on the top of one of the lodges, breaks the almost deathlike stillness. The notes are instantly caught up by others, and directly every cur in the village is taking his part with commendable energy. Commencing soft and low, the noise grows louder and deeper until it finally dies away in a prolonged wail; modulated by distance, the sound is not unmusical.

This canine *matinée*, rouses up the sleepers; a stir is evident in the village, and soon the curling smoke from the lodges floats in the morning air. The squaws, old and young, followed by the usual retinue of dogs, hasten down to the river to fill their kettles while the warriors from the tops of the lodges anxiously scan the prairies to discover 'signs' of enemies. Everything appearing quiet, the horses are driven forth, each band guarded by a young brave, who takes them where the best pasture is to be found, and brings them back at sundown. As the horses in the course of the day often stray to a distance of five or six miles from the village, the guards act also as scouts, and ranging over the surrounding hills, serve not only to discover game (i.e., buffalo), but also the approach of a war party. Timely alarm can thus be given, and the horses hurried in, while the warriors prepare for battle." Boller, *ibid.*, 51-52.

<sup>2</sup>Henry, who visited the Hidatsa in 1806, gives one a different impression:—

"We found it dangerous whilst in this village to stir out of the hut without a good stout cudgel to keep off the dogs; they were so numerous and savage as sometimes to defy the brandishing of our clubs, so that we were actually obliged to engage them. . . . Therefore, it is necessary for a person to be constantly upon his guard against the equally troublesome children and dogs. . . . At the Mandanes' we were not incommenced in this manner; they have no dogs to annoy strangers, and the children are not so impertinent. They have not the same occasion for dogs as the Big Bellies [Hidatsa], being a stationary people, whose longest excursions are only for a few days to hunt buffalo, for which purpose, and to convey home the meat, they always use horses."—Henry, A. and Thompson, D., *New Light on the Early History of the Great Northwest*. Edited by Elliott Coues (New York, 1897), vol. 1, 350-351.

<sup>3</sup>This may be a rather important observation. A coyote bites in a rapid succession of snapping bites. Buffalo-bird-woman's observation of the Indian dog tearing his teeth from the wound was brought out without any leading question.—G. L. W.



## DOGS AS PROPERTY.

Wolf-chief adds:—

The dogs of our family belonged to all the women of the household. Ownership was not divided among them.

Dogs were bought and sold. If we had a dog that was poor in flesh, weak, or otherwise of little account, we might buy a well-favored puppy to take its place. We bought the puppy after the teeth appeared and he was old enough to care for himself, that is, when he was independent of his mother. A small gift was given in exchange for the puppy.

I never knew of a trained dog being sold. I cannot say that they were never sold, but I never knew of an instance in which it happened. For a well-favored puppy, a knife or a piece of tent skin, cut out ready to trim for a pair of moccasins, or some other small article, might be given. The woman receiving the gift might keep it or present it to her husband or brother. In my family, so far as I know, neither my wife nor my mother or sister ever bought or sold a dog. However, if someone had come to our lodge to buy a dog, and the women of the household were willing to sell one, I think all the women of our household would have agreed together about the sale. If just one of the women had sold the dog to someone who wanted it, the rest of the women would not have thought this to be right. They would have said, "You have not done right. That was a good dog; we needed him ourselves."

## GATHERING WOOD.

One of the chief uses for dogs was to carry the wood gathered for fuel.<sup>1</sup> In our family, sometimes my sister, Cold-medicine, or my two mothers, or all four of us would gather wood. We always took the dogs and travois with us.

I was two years older than Cold-medicine, my sister. When she and I and our two mothers went out for wood, we usually started just after breakfast, say about seven thirty in the morning and returned about noon. From our summer village, we usually went about a mile and a half to the timber, but when we were in our winter village, the wood was nearer.

When we took the travois out of the lodge preparatory to going after wood, the dogs would bark, "Wu, wu, wu!" and wag their tails with joy. Between the three or four dogs our family usually kept, there was not much preference, since all of them were good working animals.

I never found a dog to be lazy when bringing in wood. All that was needed to make him go faster was to call him. We never whipped our dogs. It was never necessary to whip one, in my experience, to call him was enough. I would cry, "Na'! na'!" "Come! come!" and that was enough.

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<sup>1</sup>For a comparative statement of the use of dogs in the Plains see this series, vol. 5, 87, *et seq.*

We always kept wood on hand in the lodge and were careful not to let the pile become depleted. We went out to collect wood when it was convenient. If we had work in the lodge that kept us busy, we might not gather wood for five or six days; but if we had plenty of time, we might go out every day. This was especially true of the winter, when we burned a great deal of wood.<sup>1</sup>

We set out, the four dogs following in single file. As they were hitched to the travois, they never tried to escape or run away; when we stopped they invariably lay down in the road.

When we reached the timber we cut the wood into lengths two feet two inches long and piled it in the road near the dogs. A load of wood for a dog consisted of a double armful or a little more. It was tied down by the two pack thongs. Besides the travois loads each woman carried a load on her back, the sticks being cut about two feet six inches, the proper length for our fireplace. The shorter sticks were made up into loads for the travois, because the roads were narrow and the dogs could not turn to avoid trees, as the women could. We collected any kind of dry wood; gathering it among the trees, on the sandbar, or in fact wherever we could find it. The foregoing description of the manner of gathering wood is true for any time of the year.

For the load a woman carried on her back she used a pack strap. It had two bands, one going across the shoulders and chest and the other across her forehead. We used the forehead band only to rest our shoulders now and then for a short time. In that case, we let the shoulder band drop and hang loose until we used it again.

I have said that when we came to the woods we piled up our wood, cut in lengths of about two feet two inches, in the path near the dogs, who meanwhile were lying down quietly awaiting their loads. First, we loaded the last dog to arrive, or the one nearest the village. As the dogs always traveled in single file and lay down in the path as soon as we stopped, the last in line lay in the path on the side nearest the village. One of us would approach him, grasp the back of the travois basket, and turn the dog around with his head toward the village. Then we loaded the travois. In like manner, each of the other dogs was turned with his head toward the village.

In spite of the fact that the sticks were about four inches shorter, the load which a dog dragged contained rather fewer sticks than that which the woman bore on her shoulders. The travois poles were cut

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<sup>1</sup>One year later the narrator stated:—

We did not whip a lazy dog as we do a horse that does not go, for we had no lazy dogs. Sometimes the women struck a dog that wanted to bite the men. No woman ever carried a dog whip of any kind.

flat at the lower end so as to run smoothly over the ground. In summer, a dog travois could not be loaded so heavily as in winter, when it was so much easier for the dog to drag it over the snow-covered ground. Of course, we gathered wood much less frequently in the summer than in the winter.

On the return from the woods we walked in single file, our loads on our backs, my two mothers leading, talking and laughing and telling funny stories. The dogs, also in single file, followed us. We never had to lead a dog by a thong. If for some reason a dog stopped, it was sufficient to call him by name, and the dog would obey and follow.

When we arrived at home we unloaded our packs and piled them with the loads from the travois, just back of the corral in the lodge, or where the fire screen met the *atúti*. In the winter village the firewood was piled on either side of the door in the forward half of the lodge, sticks being driven into the ground to hold the pile in place. The unloaded travois were sometimes laid against the fire screen, on one side of the door, or any other convenient place inside the lodge.

Wolf-chief adds the following on this subject:—

When the women went out for wood they sought almost any kind, cottonwood, elm, box alder. Diamond willows were an exception because they threw off a great many sparks.

Three women could load about twenty dogs by noon. The women went about one-quarter to one-half or even a mile from camp for wood. A good dog could bring in nearly one hundred pounds. One or more women with fifteen or twenty dogs could bring in enough wood to last the family a month,<sup>1</sup> I think, but a family with only four or five dogs would have to go out every week.

If, on the return home, a dog dragging a load of wood had his travois stuck between two trees or between a couple of stumps, the women would go back and free him and call him on again.<sup>2</sup>

The women also used to cut green cottonwoods six or seven inches in diameter, and cut off the branches into three-foot lengths for the horses to eat (p. 175). When the horses had eaten off the bark, the branches were used for fuel.

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<sup>1</sup>Wolf-chief probably means in summer when not a great deal of fuel was needed. His use of the term "month" is often for "a long time."—G. L. W.

<sup>2</sup>"The paths leading in all directions through the timber were beaten hard and smooth as a floor, by the constant tread of moccasined feet, and the passage of numerous dog-travées loaded with wood." (Boller, *ibid.*, 192.)

"Then harnessing up some eight or ten dogs to as many *travées*, they shouldered their axes and led the van, followed by the dogs trotting demurely along in single file. Before long, the woods resounded with the dull strokes of the axes, mingled constantly with the shrill voices of the women, scolding their dogs, who, very naturally, liked to vary the dull routine of every-day life by getting up a little rough-and-tumble fight among themselves. When a dog had his full load he was led to the main pathway, and after receiving a couple of practical reminders on his head from the axe-handle, to attend to his own business, started for his lodge, dragging his *travée* with great steadiness. Unless caught on some obstruction (in which case he patiently awaits his release), he quickly arrives at his destination, and finds some of the family ready to relieve him of his load and turn him loose to steal or fight among his brethren for his dinner. Several hours later, the squaws are seen coming back in parties, with a retinue of dogs, all loaded as heavily as possible." (Boller, *ibid.*, 193–194.)



Dogs were also used to bring in dry grass or hay for the horses. Hoes were taken along; the grass was cut, tied on a travois, and brought home. This was done in the winter village. It was very much easier for the travois to run on snow than on the bare ground and for this reason travois were used a great deal in the winter.

### COLLECTING WOOD FROM THE RIVER.

As it was nearer to bring wood from the Missouri than to go to the timber for it, in the summer time we used to catch floating logs from a bull-boat with a noose. My sister or one of my mothers would go with me; usually I paddled and she carried the noose. If we saw a log floating down the river I paddled out to it and my sister threw the noose, caught the log, and we towed to shore. We piled the wood up on the shore. Sometimes we caught floating logs with a hook about fifteen feet long (Fig. 38). Men and women worked together pulling in floating wood with these hooks. My father liked to do this and sometimes stayed down by the river a whole day, pulling in firewood. In those days there was a great deal of wood, but near Like-a-fish-hook village it was rather scarce because we sold so much of it to steamboats. The wood collected from the river, we afterwards carried up the bank on our backs. We thus saved time. I carried short sticks up in a load with my packing strap; longer sticks I bore on my back, as shown in Fig. 39, or let one end drag on the ground.

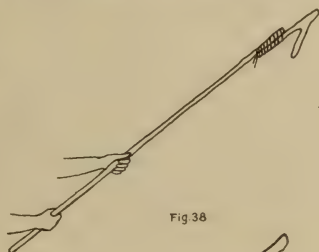


Fig. 38



Fig. 39

Fig. 38. Hook for hauling in Floating Logs in the Missouri River.

Fig. 39. Sketch showing how Long Sticks of Wood are carried by Women.

### FETCHING FIREWOOD AND GAME BY BULL-BOAT.

A good place to gather firewood at Like-a-fish-hook village was in the timber about two miles from the village, on either side of the river. Sometimes two or three or four women carried bull-boats<sup>1</sup> with them. Sometimes we gathered wood on the side of the river on which the village stood; sometimes on the other side. A bull-boat was carried with the

<sup>1</sup>For the bull-boat see pp. 248, 253-254 and 271.



mouth pointing backwards and with the bottom resting on the woman's neck, held in place by her pack strap.

We used to go out in the morning and return in the afternoon or evening. The boat was loaded in the water. It was filled to the top with sticks cut to fit the size of the boat. Then two sticks were thrust vertically in the back of the boat to extend beyond the load and more wood was stacked up against these (Fig. 40). A space was left in front



Fig. 40



Fig. 41



Fig. 42



Fig. 43

Fig. 40. A Bull-Boat loaded with Wood being paddled across the Missouri.

Fig. 41. Reviving an Unconscious Dog.

Fig. 42. A Bob-Tailed Dog.

Fig. 43. Goodbird's Sketch of a Dog (Took-away-his-shield).

for the woman who sat on the bottom of the boat with her feet to the right as there was not room enough to kneel.

If we went for a whole day we took along a lunch of biscuits, bacon, and coffee, though in olden times this would have been of buffalo fats with whole parched corn carried in a heart skin.

Once I went hunting with my husband. We took a dog and carried a boat on a travois.<sup>1</sup> We stayed all night in the woods and returned to the village in the evening of the next day. We came back in the bull-boat, carrying a doe and two fawns, and the dog, besides ourselves. We

<sup>1</sup>For loading dogs with bull-boats, see pp. 231-232.

bound our travois to the boat in such a way that the skin saddle of the travois was out of the water, but the basket and lower ends of the poles dragged in the current.

We had killed the deer early in the morning. My husband had watched for deer the evening of the day we arrived and the next morning,—the morning in which the deer were killed.

It was difficult to carry a boat on one's back in an adverse wind. For this reason in windy weather we preferred to take a dog rather than to carry the boat, since a dog was not very high and the wind did not strike the boat with the same force as it did if the boat were on a woman's back.

It was not at all unusual for my husband when going upstream to hunt deer to take one of our dogs with a bull-boat on his travois. He would then float downstream in the boat with his game as I have described.

Once Son-of-a-star and Charging-enemy went up the river afoot from old Fort Berthold to the upper Knife River. They took a dog with them to carry their bull-boat. They hunted in the evening and morning and got a great deal of meat which they brought back in the boat. Their dog rode with them in the boat on the way back.

#### TRAINING A DOG.

It took about four days to train a dog to drag a travois. At first, when he was hitched to the travois and called by name, he struggled and whined with fear, but the woman coaxed and called to him, until he started toward her. The first three days the woman tied a thong around the dog's neck collar and led him. By the fourth day the dog had learned and would follow his owner. For the first trip very little wood was loaded on the travois, but the amount was increased from day to day until the dog could drag a full load. Some dogs were much stronger than others and could carry a much larger load. We always knew which dog to load the heaviest.

Wolf-chief gives the following supplementary data:—

Sometimes a hungry dog ate so fast that the food stuck in his throat and he fell dead. We Indians say he fell dead, but I think you would say that the dog lost consciousness or swooned. At such a time the woman would take up the dog and bring him down against the ground on his hips as in Fig. 41, alternating with thumps of her fists on his backbone just above the hips. In a moment the dog would come to life again with a yelp.

As a dog grew up he was broken to dragging a travois. When a travois and harness were put on him he whined and tried to squirm away from it. But the woman

coaxed and called him and with a string tied to his collar under his throat pulled him gently to the timber where she loaded the travois very lightly. The load was increased from day to day as the dog learned.

I never saw a dog bear any burden but a travois and its load, but I have heard that a war party once took a dog along that was broken to carry a burden on his back.<sup>1</sup> They put a saddle on the dog and bound moccasins and food on it. Perhaps the dog guarded the camp from the approach of a wolf or an enemy and was taken along for this purpose, but I do not know.

A dog sometimes fell sick and died. A woman would give him a few blows on his legs with a withe and he would come to life again. Dogs gave this power to some people in a vision. Dogs had sacred uses; they were used in certain ceremonies.

### NAMES AND DESCRIPTIONS OF OUR DOGS.

Let us suppose a woman in the old times had a dog she wished to have named. In that case she would call upon some man who had won honor marks and he would give the dog some such name as Strikes-lodge, or the like. Sometimes, however, the women in the lodge named the dog after some peculiarity he had.<sup>2</sup>

When I was about eighteen years old we had five working dogs, the largest number we ever had in our family. They were as follows:—

Mida-padāpa-ě-ěc, or Feather-lance-carrier, a bitch. She was named by Big-cloud for an enemy whom he struck and who carried a feathered lance. She belonged to my grandmother, Otter. She was a bobtailed black dog with spots.

Itā-widāka-kaic or Took-away-his-shield, named by Big-cloud; a castrated male; belonged to Strikes-many-women; had black spots and a tail like a wolf. Goodbird has made a sketch of this dog. (Fig. 43). He has shown it to me and it looks very much as the dog looked. I have shown him where to draw the spots on his body.

<sup>1</sup>This was probably an experience of Wolf-chief's when visiting the Crow.—G. L. W.

The Crow did not use the travois very much, while the tribes to the northwest of them seemed not to have used it at all. Instead, they used dogs as pack animals. See this series, vol. 21, 220.

Harmon, Daniel Williams, *A Journal of Voyages and Travels in the Interior of North America* (New York, 1903) writes as follows:—

"Those Indians, who live in a woody country, make no use of horses, but employ their large dogs, to assist in carrying their baggage from place to place. The load is placed near their shoulders, and some of these dogs, which are accustomed to it, will carry sixty or seventy pounds weight, the distance of twenty-five or thirty miles in a day.

The Assiniboin, Rapid Indians, Black feet and Mandans, together with all the other Indians who inhabit a plain country, always perform their journeys on horse back." (290.)

<sup>2</sup>No doubt the naming of dogs in this definite way was widespread, but escaped observation. See however, this series, vol. 21, 221.

Harmon in writing of Indians in general states that:—

"The Indians, throughout the whole country that I have visited, have no other animals domesticated, excepting the horse and the dog. Of the latter, they have several different species. Some of them are very large and strong, and are employed in carrying burdens; while others, which are small, assist their masters in the chase. All Indians are very fond of their hunting dogs. The people on the west side of the Rocky Mountain, appear to have the same affection for them, that they have for their children; and they will discourse with them, as if they were rational beings. They frequently call them their sons or daughters; and when describing an Indian, they will speak of him as father of a particular dog which belongs to him. When these dogs die, it is not unusual to see their masters or mistresses place them on a pile of wood, and burn them in the same manner as they do the dead bodies of their relations; and they appear to lament their deaths, by crying and howling, fully as much as if they were their kindred. Notwithstanding this affection, however, when they have nothing else with which to purchase articles which they want, they will sell their dogs." (289-290.)



Nuwatsa-kitēc, or One-killed; named by Big-cloud; a castrated male; belonged to Strikes-many-women; white, with black spots; had a tail like a wolf.

Nahí-kutic, or First-killed; named by Big-cloud for an enemy that he helped kill; a castrated male; belonged to Red-blossom; White with black spots; tail like a wolf.

Aduxá-xitsidic, literally Spot-red; in English we would call the dog, Red-spot. He was a castrated male; belonged to Red-blossom. We women named this dog from his appearance. He had a tail like a wolf.

Of these five dogs, the first-named, Feather-lance-carrier, was the mother of the other four.

There were a good many bobtailed dogs in the village, at least enough of them to make them common, although they were not as numerous as the others.<sup>1</sup> There were perhaps about ten bobtailed dogs in the village. The bobtailed dog was born so and not made so artificially. A bobtailed dog or a dog with a tail like a wolf was equally good as a worker—it made no difference. My aunt had a bobtailed bitch which gave birth to a litter of puppies. I looked over the litter and found one that I liked very much and my aunt gave it to me. It was the first born of the whole litter, quite a large puppy, and was the only bobtailed puppy in the litter. I do not remember how many there were in the whole litter. The first-born puppies of a litter were always stronger and better dogs.

In Fig. 42 is a good likeness of this bobtailed puppy after it grew up. As you see, the tail is short. The dog was all black.

Wolf-chief gives the following supplementary data on the subject of names:—

Although the women of the household owned the dogs, they did not name them. A woman did not name even her own dog, but got her "brother" to do it.

I gave names to two female dogs; one I called Itsi-děca, meaning Foot-none or No-foot; the other dog I called Caki-děca, or No-hand. The reason for these names is as follows:—

Once, about in August, at Like-a-fish-hook village, two enemies attacked us. We gave chase and killed them both. I was the second to count coup on one of them and we found that he had a hand that was small and withered. Therefore, I called one dog, No-hand.

On another occasion, our people were picking juneberries in the woods when they noticed two men on a high hill who were looking toward the village. They told the villagers. At night we went out and found these two men attempting to steal a pony. We gave chase. One of them turned to fire at me, but his flint did not set fire to the powder. The man next to me shot at him and killed him. I reined in my pony

<sup>1</sup>No other mention of bobtailed dogs is known to the Editor; hence, it seems likely that this was a mixed-breed from trader stock. Such could well have been introduced long before the birth of the informant.



and scalped the enemy. In the morning we found that this enemy had a full-sized moccasin on his right foot, but that he had lost part of the foot itself. Therefore I named one dog, No-foot.

The men who killed these two enemies cut off the right leg of the man who had an imperfect foot and took it to the village. They removed the moccasin and showed the foot to the people. The villagers could not tell whether it was a man's foot or not, it was of such a strange shape. It looked like a hammer. I could have named the dog, Took-a-scalp, from the fact that I scalped the enemy, but we usually named the dog from something that we observed about the dead enemy, or from something that struck us as humorous. It was because we laughed at this strange foot that I called the dog, No-foot.

My father, Small-ankle, once called a dog, *Īta-măétsi'-da-iada-kútsic*, his-knife-with-his-own-hair-take. A free translation of this would be, "took his hair with his own knife," that is, with the dead man's knife. The dog belonged to us and I remember the circumstances very well. It was my father who scalped an enemy with his own knife.

Once when my father was a member of a war party they came near an enemy village and watched in the hills for someone to stray from the village. A man came out of the village. My father and his friends shot the man's horse with a gun; he tried to escape, but they overtook and killed him. They found the slain man had his face painted black, which was a sign that the villagers were rejoicing over a dead enemy. For that reason my father named one of our dogs, *Ita-cipíhe-nakapěc*, "his-face-black-leader's-honor-mark." The word *nakapěc*, means the honor mark that belongs to a leader who has commanded a war party that killed an enemy. Symbolic of this honor mark some human hair is fastened on the shirt of the leader.

Another one of our dogs was named *Mătax'-apihec*, from *matăxi*, turtle, and *apě'hes*, necklace. Once there was a great battle at the mouth of the Knife River, with thousands on each side. One man from the other side rode forward against the Hidatsa. Small-ankle leaped from his horse and awaited him. The Sioux, who was riding, shot at Small-ankle as he came forward, but since Small-ankle did not retreat the Sioux turned to go back to his own men. Small-ankle fired and the Sioux fell. The Hidatsa ran forward and cut up the body, for it was our custom at that time to scalp an enemy, cut off his hands and feet, and mash in his head bones. The Hidatsa found that the dead enemy had a necklace made of a strip of red cloth with a green turtle shell fastened to it. The shell was just a turtle back scraped clean of the flesh. The red cloth was drawn through a hole in the shell. Very likely the turtle shell was a mystery object.

Other names<sup>1</sup> of dogs are as follows: First-strike; Last-strike; Caught-with-the-hand; Crying-one; Killed-many-enemies; Stabbed; Shot-with-an-arrow; Killed-by-a-club; Ran-over-him; Brought-an-enemy's-horse; Took-an-enemy's-horse; Brave-man; Chased-an-enemy; One-enemy-struck; One-enemy-killed; Cut-loose (i.e., cut a picketed horse loose); First-to-see-an-enemy; Captured-a-horse-in-battle; Dismounted-in-big-battle; Knife-carrier; and He-wept-being-caught-by-the-hair.

We kept one dog in our lodge for breeding. He was quite large, red, and his name was Akikahie, or Took-away-from-him. Once in battle, ene-

<sup>1</sup>For other dog names, see pp. 231-232.

mies captured Big-cloud's horse. He gave chase and recaptured it. For this reason he named the dog, Took-away-from-him, in memory of the horse he had recaptured.

Although we had only four working dogs in our family, we often had more in the lodge, for there might be one or two dogs too old to



Fig. 44

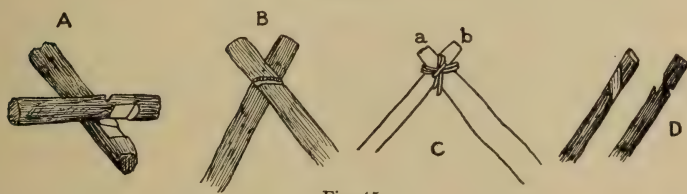


Fig. 45

Fig. 44. The Dogs run off to Fight while Goodbird rides on the Travois.

Fig. 45. Travois Poles, showing Manner of Attaching and Tying.

work, or young ones we were raising that were not yet old enough to be broken to dragging a travois. Four dogs were quite enough for our work; but we were always careful to have young dogs growing up to take the place of the old ones whenever they were needed. One of our dogs lived

to be about twelve years old. When a dog grew too old to work we kept him in the lodge without working. When he died, his body was thrown into the river or far away in the woods. We never shot an old worn-out dog, that I remember.

#### CHILDREN RIDE ON A DOG TRAVOIS.

Small boys sometimes jumped on a dog travois to ride just for the fun of it. Once I asked my husband to go for wood with me to the timber east of the village. I had three dogs and travois. My son, Goodbird, who was then four or five years old, wanted to go along. My husband and I said, "No, you cannot go." Goodbird wept and wept, so at last we took him with us. As we went along, my little son jumped on and off the travois, walking and riding, and playing with the dogs. The dogs got into a fight and ran off with my little son. He was much frightened and we laugh about it to this day.

Goodbird:—

I remember that. There was a road down to the timber and another road that led to the chokecherry hills crossed it. We were going along the latter, my father and mother walking ahead, when a woman came down the first road on her way to the village. She had two or three dogs with travois. Fig. 44 shows the relative positions of our two parties. Our dogs saw the others and started across the triangle that lay between the two roads. The other dogs also turned toward ours barking. I yelled, "*Ai, ai, ai!*" I was dreadfully frightened; the dogs were leaping along at such a rate that I was afraid to jump off. The other woman ran between the dogs with her arms up in the air. "*Na! na!*" she cried. "Go away! Go away!" That stopped our dogs. I jumped off the travois and ran to my mother. I did not want to ride on that travois again!

We never put small children tied in their cradle bundles on the travois because the dogs lie down often, indeed, every time the march stops. It was common, however, to ride a few miles on a horse travois to rest oneself. Sometimes a boy or girl or perhaps both were permitted to ride on top of the load on a horse travois. At times a bull-boat, mouth up, was bound to a horse travois. We often put a boy or girl old enough to run about, but not old enough to be very strong, in the bull-boat, but a baby was always carried and cared for by the mother. We would not have risked putting a baby in a bull-boat unless the mother was with it.

#### MAKING A DOG TRAVOIS.<sup>1</sup>

When I needed a new dog travois frame I made it of two long cottonwood poles or of poplar (birch?). This last has a white bark with leaves

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<sup>1</sup>See pp. 281-283.



similar to, but smaller than, cottonwood. It is very light and for that reason valuable for a travois.

We always kept new travois poles on hand. My father cut the green poles in the timber, peeled off the bark, and laid them on the corn-drying

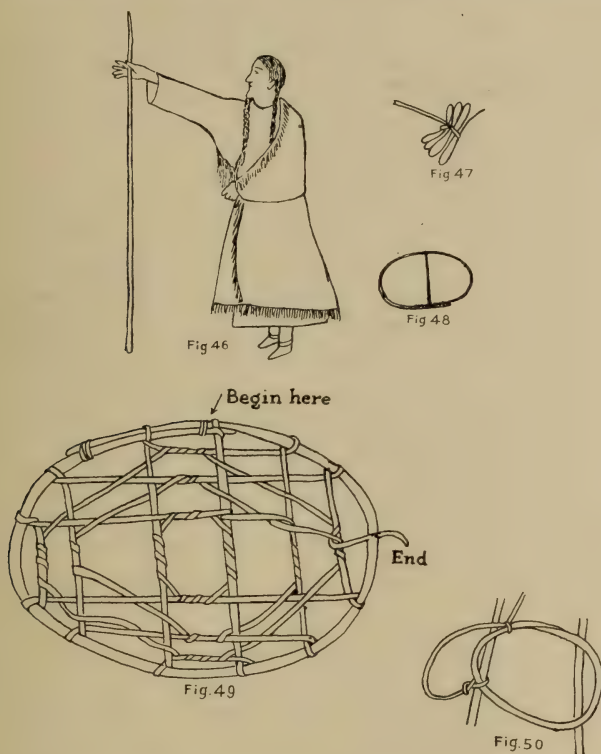


Fig. 46. Measuring the Pole which is to form the Rim of the Travois Basket.

Fig. 47. Looped Bundle of Rawhide Thong prepared for Netting Travois Basket.

Fig. 48. The Rim of the Travois Basket held in Shape, for drying, by a Rawhide Thong.

Fig. 49. The Completed Travois Basket.

Fig. 50. The Tie for securing the Load to the Travois Basket.

stage to dry. They were always dried thoroughly before binding them together to make a frame. The poles of a travois frame had to be replaced about every two years, but the basket and its woven cushion were merely transferred to the new travois.

The travois frame poles were usually about one and one-quarter inches in diameter at the upper ends and increased to about one and three-

quarter inches at the lower ends which were cut flat so they could rest on the ground like runners. The best travois poles were a little curved and were so bound together that the curve arched upward so that the basket was carried on the top of the arch. The weight of the loads tended to bear the poles down so that if a travois were made of new, straight poles, it was not long before the frame sagged out of shape. The travois frames built to arch upward a little, were only straightened by the basket weight and therefore lasted much longer. For this reason, when we went out to cut travois poles we were careful to search for young trees that were slightly bent.

To make a new travois frame, I notched two poles at the upper or smaller ends, tying them firmly with *itsúta*<sup>1</sup> tendon of the buffalo. There were two of these tendons, one lying on either side of the neck vertebræ. One of these was cut into strips about three-eighths of an inch wide. The green tendon was drawn around the poles three times and tied. When it dried it held the poles firmly together. A green rawhide did not make a very good tie as it was apt to loosen as it dried. As will be seen in Fig. 45, a transverse notch was cut across the upper and lower pole to receive the tendon. Fig. 45A shows the two poles ready to be joined. In Fig. 45B the poles are joined with the transverse notch on the upper pole, while in Fig. 45C the two poles are bound together by the *itsúta* tendon. In Fig. 45D the ends of the two poles are viewed from different sides. The stumps of the joint in Fig. 45C (*a* and *b*) were very short, only a couple of inches long.

I cut the green ash pole for the basket hoop in the timber myself. I cut a pole tall enough to reach to my shoulder when standing (Fig. 46) and about five-eighths of an inch in diameter. In the figure drawn by Goodbird (Fig. 46) the section of pole above my hand is to be cut off. I am measuring on the pole with my palm, the place where it is to be cut.

After cutting the pole, I tested it, bending it under my foot to see if it was tough and elastic. At home I heated it over a fire, passing it back and forth over the coals to keep it from burning. When it was well heated, I bent it under my feet, moving it around and treading on it to make it pliable. I shaved down the heavier end for the joint, bent the pole to form an oval, and tied it with thong. As the bark formed a protection against breaking while heating and making the pole pliable, it was not peeled off until the hoop was bent into shape. Then a rawhide thong was tied across the center of the hoop to make it hold its shape

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<sup>1</sup>The tendon that holds up the head and neck of the buffalo.

while it dried (Fig. 48). It was now left on the drying pole in the earth-lodge, near or over the fire, for three or four days. I always hung it just a little way from the chain on which the pot was hung.

Then I soaked a dry rawhide with the hair scraped off, either in a pail of water or in the broth made by boiling dried meat. The broth had to be tepid; if too warm, the hide would spoil. We saved this meat broth to drink. When the hide was well soaked and softened, I took it to my father, Small-ankle, to be cut. To do this, he cut the corners round, and then cut a spiral toward the center, resulting in a long thong about three-eighths of an inch wide, which he colored red by drawing the thong through the palm of his hand in which he held some moistened red paint, such as we obtained in the hills. It was a rule that all our travois baskets be red, though I do not know why. After cutting the thong, Small-ankle tied one end to the basket hoop and looped the rest into a bundle tied with a strip of hide (Fig. 47). As he wove the thong back and forth on the frame (Fig. 49), the looped bundle (Fig. 47) unraveled loop by loop without tangling or knotting.

Fig. 49 is drawn from a small model I have made, but the principle of the weave and the pattern hold for the full-sized travois basket. In the small model sections between the thong are one-half an inch in diameter; in the full-sized model they average roughly one and one half inches. This type of weave is used both for the dog travois and the horse game basket; that for the horse travois basket is different.

When Small-ankle finished weaving the basket, I hung it to one of the posts of the corn-drying scaffold by a string. The wet thongs dried in about a day. Then I bound the basket to the travois poles with thongs of tent skin at the four places where the basket crossed the poles. It will be noted (Fig. 49) that the joint of the basket hoop always lies uppermost. This was always true of the dog travois basket. On the horse travois, however, the basket might have a joint on either side, either on the side toward the top or the bottom of the frame. On neither a dog nor a horse travois was the joint placed on the sides of the basket where it was bound to the travois poles.

A dog travois was in almost daily use, while the horse travois was used less frequently. We regarded the horse travois as having been recently introduced into our tribe, but we had the dog travois from very old times.

After the travois frame was completed and the basket bound on, I put on the buffalo skin saddle, or cushion, to protect the dog's back and shoulders from the hard poles. This was made of buffalo skin, hair side



out, and was sewed on so that the seam was uppermost and the smooth fur rested on the dog's shoulders. Then I sewed on the two oiled rawhide loops, one longitudinally and the other transversely with the poles. Then I fastened on two rawhide packing thongs. The breast band and neck collar were also of rawhide.

A load should be bound to the lower edge of the basket with the two packing thongs mentioned above. Each thong should be tied on its proper side, to the lower edge of the basket at the same place that the basket is tied to its pole. The packing thongs should be made to pass around both the pole and the basket hoop (Fig. 50).

Sometimes women made their own travois baskets. When they did, they painted the baskets red. We also painted the hoop for the hoop game red. We used red a great deal for decoration. I never saw new, unpainted, dog travois baskets; they were always painted red, as were also the game hoops. Horse travois were unpainted.

I never knew of dogs being used to drag sledges or anything like a sledge, such as a boy's buffalo rib slider or a buffalo skin laid down on the snow and hitched to a dog. As far as I know, we had no such customs.

We ceased to use dog travois about thirty-four years ago when we obtained wagons from the Government (about 1879). At about the same time horse travois passed out of use. Fifteen wagons were issued the first summer and fifteen the next summer. Pretty soon everyone in the village used them. We often borrowed wagons, one from another.

Wolf-chief adds:—

Usually, the travois, when not in use, were leaned against the entrance way to the lodge or against its side. They were stacked one against the other like folding chairs, but if there were too many for one pile, the stacks were separated.

In order to carry the loads travois had baskets with skin lacings, usually painted red, bound to the poles. These baskets were about 36 inches long and 25 inches wide. These baskets were woven only by skilled persons who were paid for their labor. Small-ankle was very skilful in weaving these baskets. The men also wove snowshoes and game hoops. The red-painted thongs for the basket lacings signified that the weaver had obtained an honor mark for striking an enemy. For example, Small-ankle, who had been a successful leader of war parties, had the privilege of painting his face red as a symbol of joy. Thus, if a woman whose husband had never been to war should come to Small-ankle to have her travois basket woven he had the privilege of painting it red because of his war record. The red paint on the basket always referred to the deeds of the weaver and not the owner. There were, however, unpainted travois baskets in the village because the maker had no honor marks. My father, Small-ankle, told me this and taught me how to make a travois, but I am not very good at it.

My father did not think it a very important matter to make a travois basket as it was not sacred. Besides, he had an opportunity to paint it red and he knew the woman would be sure to show the travois to others in the village so that he would be

raised high in the esteem of the people. Because of this it was not thought necessary to make any payment for the making of a travois basket, though a small gift was very often offered. However, when the duty to be performed was a sacred matter, a good price was offered, as for instance, when my sister, Buffalo-bird-woman, was called in to put up the four central posts of an earth-lodge or to cut the skins for a tent cover, and prayed while doing so.

The lacings of a travois basket were made of the skin of a buffalo bull, taken from the belly and legs, where the skin is always thin. The skin of the back and neck of a buffalo is too thick for this purpose. Sometimes green hide was used; sometimes a dry rawhide was softened by soaking, cut into strips, and used. A dressed hide would sag soft if it became wet. The object of the weave was to have a good spring to the basket.

The woman, or her husband if she had one, who desired the travois, furnished all the materials. The two poles were of cottonwood and the basket hoop of ash. If the woman did not know how to make the hoop, she brought it to the maker. If she did know how, she bent and braced the hoop into shape while her husband held it. As a rule, the woman prepared the hoop and left the weaving to the maker. She and her husband prepared the hide for the lacings, but left their cutting to the weaver. Sometimes, instead of taking the material to the weaver's lodge, she might call him to her lodge.

The travois saddle was made of skin from the shoulders and neck of the buffalo where the hair is thickest. It was not stuffed with hair inside. The joint of the poles was firmly bound with buffalo neck sinews that are strong and heavy and the skin saddle was then sewed on with buckskin thongs. The saddle was made by the owner. The harness was made and put on by the woman.

A dog travois was about eight feet long. The flat part of the travois poles that dragged on the ground was about eighteen inches long.

#### DOG TRAVOIS SHELTER TENT.

When my son, Goodbird, was about seven years old, word came to the village that chicken-pox was coming. The Agency people said, "Chicken-pox is going to come here. We think it best for the people to go away and not come near the Missouri River for a while. The Arikara who live farther down the river have the chicken-pox and we think that it will be brought up the river to this village." All our people were made quite uneasy by the news. We knew that chicken-pox was not as dangerous as smallpox, but either disease was bad enough.

It was juneberry time and our whole village packed up and went north and camped. As I have said, the Agency people warned us to keep away from the Missouri River for fear that chicken-pox might be brought to us by travelers who came up the river. As out in our country timber grows only along the rivers, our camp, pitched away from the Missouri, was at a place where we found not very much timber, and what we did find was small size and scant. Because of this we could

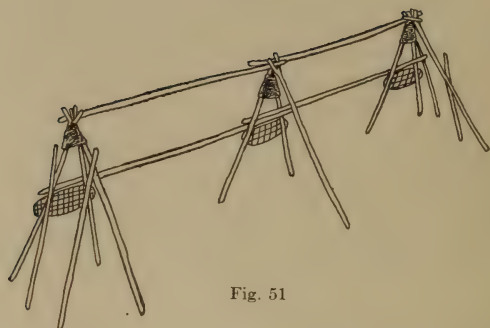


Fig. 51



Fig. 52

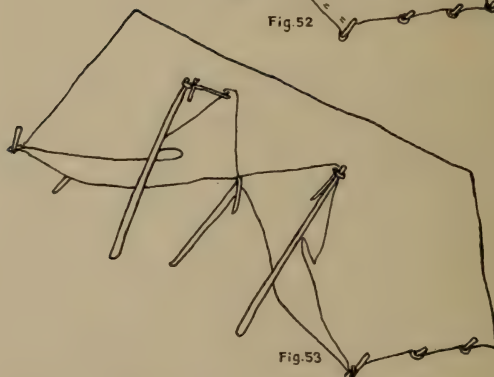


Fig. 53

Fig. 51. Frame for Shelter made by setting up Three Dog Travois and adding Several Extra Poles.

Fig. 52. The Shelter with Flaps closed for the Night.

Fig. 53. The Shelter with Flaps raised to allow Circulation of Air.



not conveniently find tent poles. We were able to find a few forked sticks here and there and some small wood which we cut. Our camping family was rather large; there were eleven of us in our tent.

We were able, however, to make a tent, or perhaps I should say, shelter, with our dog travois. Three travois were stood up about five feet apart in a line and each propped at the top against a forked stick, bound securely to it. Thus each travois and its forked stick support made a tripod. A railing ran along the tops of the three tripods and a

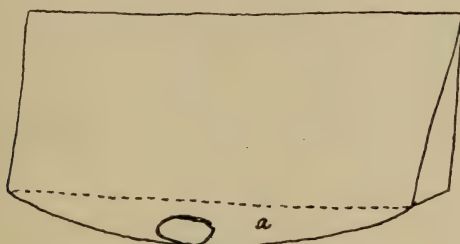


Fig. 54

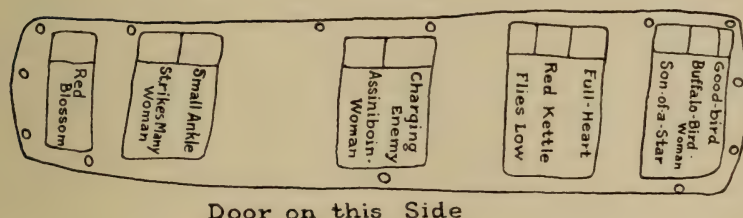


Fig. 55

Fig. 54. Rear of Shelter Tent with Excess of Cover weighted down with a Stone.

Fig. 55. Interior Sleeping Arrangements in Travois Shelter Tent.

second railing ran along the sides just above the baskets. All the baskets of the travois lay toward the weather side of the frame. At each end of this frame two extra poles were bound, one to the travois, the other to the forked stick support. These extra poles were to give the tent a rounded form at the top.

Over the frame thus made (Fig. 51) we stretched a tent skin. In Fig. 52 is shown the tent as it looked at night when closed. In the daytime an entrance was made by raising the two smoke flaps and binding them with thongs to the tops of two sticks to prop them open (Fig. 53). These smoke flaps were propped open all day to give air. The rear of the tent is shown in Fig. 54. As the bottom of the tent was round, this left a rather

large margin which lay on the ground Fig. (54a) weighted down with a small log or stone. The floor of the tent was made of tent skins.

There were five beds. Beginning at the left (reckoning Indian fashion) was the bed of my husband, myself, and Goodbird. Although seven years of age, Goodbird still fed at my breast. The second bed toward the right was that of Full-house, Red-kettle, and Flies-low. I have forgotten in what order they slept. As will be noted in the diagram (Fig. 55) Goodbird slept nearest the end of the tent in our bed. My place was in the middle and Son-of-a-star slept on the right. The third bed, passing toward the right, was that of Charging-enemy and his wife, Assiniboin-woman. It will be noticed that Charging-enemy slept on the left and his wife on the right. The next bed was that of Small-ankle and Strikes-many-women. Red-blossom was last. In Fig. 55 are shown the relative positions of the beds and the position of each sleeper, as I remember them.

We had driven from Like-a-fish-hook village in a wagon and there were a number of other wagons in camp. Quite a number of the families had erected tipis. While we were camped here, a terrific storm of rain and wind came up, so severe that many tipis were blown down and wagons were overturned; but our shelter withstood the storm safely. During the worst of the wind, we held the frame firmly, the better to withstand the wind. Small-ankle and his two wives grasped the first travois on the right; Charging-enemy and his wife held the middle travois; and my husband and myself held the travois on the extreme left of the frame. In this way we prevented the tent from being blown over.

Goodbird interrupting:—

I remember that tent very well. I was seven years old at the time and I remember it because of its unusual form. Figs. 52 and 53 are correct, because I remember how that tent was put up. It was an unusual form, but it made a very good shelter for us in that camp.

My husband, Son-of-a-star, once told me of another way to make a tent out of dog travois. Three travois were joined together at their tops and a piece of tent skin drawn around the frame thus made. Two persons could be accommodated very well in such a shelter. I myself never saw such a tent, but my husband had. Fig. 57 represents the frame of such a shelter drawn by Goodbird after my husband's description.

## ADDITIONAL INFORMATION CONCERNING DOGS.

## (Narrative of Wolf-chief.)

## DRAGGING TENT POLES.

Before a dog was made to drag tent poles, a light load of something that was not fragile, like a robe or a few blankets, was bound down over the travois and then the travois was harnessed to the dog. As dragging tent poles was heavy work a good strong dog was chosen, perhaps one called Short-tail or Four-eyes from his looks. The poles, ten, twelve, or thirteen in number, were strung together by a thong through holes pierced at their smaller ends. Then the tent poles were fastened at, or near, the fork, the smaller ends of the tent poles projecting about two feet beyond the dog's head. The tent poles were then spread out over the travois basket and bound down. A big tent might have poles six paces long. Such poles, when bound to the dog travois, might extend three feet beyond the dog's head (Fig. 56).<sup>1</sup>

## CARRYING WATER FOR DOGS.

There was a warm weather custom of carrying water for a dog in a buffalo paunch. A piece of a skin tent, two and one-half to three feet in diameter, was laid flat on the travois basket, and some grass spread over it. A buffalo paunch was filled with water, the mouth skewered with a stick, and tied with a buckskin thong (Fig. 58). Then the water-filled paunch was placed on the grass-covered tent skin with the mouth of the paunch upward and the whole was tied with rawhide thongs.

When the dog became thirsty on the road, the woman untied the paunch and held the mouth open while the dog lapped up the water. If there was more than one dog, they were allowed to lap one after another. If there was any water left when they had all quenched their thirst, the paunch was tied up again. Otherwise, the paunch was kept and filled up again at the next opportunity.

Dogs dragging heavy loads could not go very far without water. When five or six dogs were taken out, perhaps two of them might carry buffalo paunches filled with water.

In winter, if water was ever needed by a party on the road, snow was melted with hot stones. A hole was dug in the ground and a green hide or a buffalo paunch spread in it; snow was shoveled into the hide and hot stones placed on it. I do not mean that in the winter a party

<sup>1</sup>This account by Wolf-chief and the diagram, needs some corroboration. Throughout his entire account, Wolf-chief shows himself familiar chiefly with generalities, while Buffalo-bird-woman gives everything in careful detail. I have elsewhere made a few observations concerning the two accounts.—G. L. W.



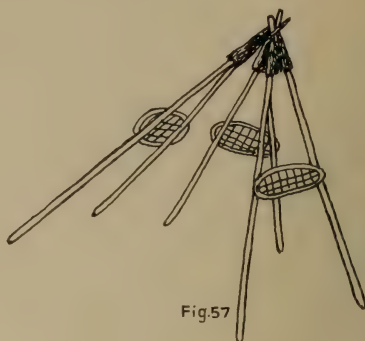
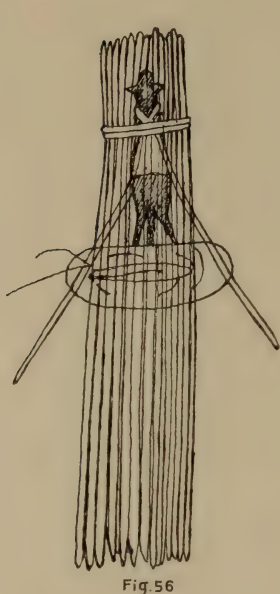


Fig. 56. Diagrammatic Sketch showing Dog dragging Tent Poles lashed to the Fork of the Travois.

Fig. 57. Three Travois set up to form a Tent Frame.

Fig. 58. A Buffalo Paunch filled with Water, tied with a Buckskin Thong, and skewered with a Stick.

would stop and melt snow so their dogs could have water, but merely that if water were needed while on the road it was the custom to melt snow in this way.

#### BRINGING IN MEAT BY TRAVOIS.

Because dogs required a good deal of water in the summer they were not used so frequently for bringing in meat in the summer months as they were during the winter, when they could quench their thirst with snow. During the summer they suffered a good deal if they had to drag loads a long distance without water. In going uphill in winter a dog frequently lay down on his belly and bit off the snow which balled between his toes. At such a time the owner would wait and when she thought the dog had had sufficient time to rest, she called and the dog would follow. The dogs followed the owner in single file. If one got tired and stopped, all the others stopped too. After a wait, the owner

would call out and the dogs would resume the march. When the owner stopped all the dogs lay down to rest, not upon their sides, but upon their bellies.

When a man killed buffalo in the hills in the winter he usually brought home some of the meat when he returned. The next day, he and his wife went out with the dogs and travois and brought in the rest of the meat and the bones. The killing may have been as many as seven miles away, but such a distance was no hardship to the dogs as the travois dragged easily on the crust of snow always found on our prairies.

When the dogs came to the butchering place they did not struggle to get at the meat. "Lie down!" the owner would say, and the dogs obeyed. They were not fed much at the butchering place, for if a dog was allowed to gorge himself he would vomit it up on the way home. If they were hungry, they might be given a very little to eat.

On the way home, the dogs might be fed two or three times. They were not given very much, only a little piece to each dog, for fear that the dog would vomit and get heavy on his feet and break through the snow crust. When they arrived home, the dogs were given all they wanted to eat.

When the train came to the village, the other dogs of the village did not trouble them. The travois were unloaded and the dogs fed. They were given either cooked or raw meat; if the latter, some of the tough parts that were not much desired. The dogs ate eagerly, for they were big eaters. There was no danger of their getting sick, now that the haul was over. All the family, men and women alike, came out of the lodge door, unloaded the dogs and took the meat inside.

The meat was unloaded just outside the earth-lodge door. Then the travois was taken off each dog, usually by the owner or someone else in the family. The women attended to this part of the work, but the men helped carry in the meat.

In loading the travois, the meat was laid, raw and uncovered, on the basket and merely bound down with rawhide rope. No skin was laid over it to protect it. The dogs were too well-trained to try to eat meat from the travois in front. Perhaps a newly broken dog would, but no other.

A load for one dog was one-quarter of a buffalo, that is, an Indian quarter, cut off from the backbone. The hide which weighed about eighty pounds might make a load for a dog.

When we Indians butchered, quite a strip of the flesh was taken off the outside of the ham because it was tough. The remaining parts,

together with the bones, weighed perhaps one hundred pounds. Such a piece made a load for a dog. A rawhide rope went back and forth over the travois basket to hold on the load.

I have heard some people say that they have known of one dog that brought in half of a buffalo; but this dog took sick and died afterward from the effect of the haul. I doubt this story because half of a buffalo makes a very heavy load and I do not think that any dog would be strong enough to drag it.

It took about three or four hours for dogs to bring home loads from a butchering place seven miles away. The pace was not fast. On the way to the butchering place the men and women hurried, running and walking alternately, but on the return the pace was slower. When returning from the butchering place the men and women did not pack meat on their own backs, but they might take horses with them. A whole buffalo carcass could be loaded on a horse and the owner could still ride.

The travois baskets were not cleaned or washed after they were brought in. They were just allowed to dry. Our dogs never chewed the travois baskets. If strange dogs came near, the dogs of the household would chase them away.

#### THE LEADER.

We had a good dog in our family named Face-painted-black. I do not remember things very plainly as I was a boy then, but I am pretty sure that Face-painted-black was the leader of the dogs of our household. I recollect that when the women of the lodge started out they would often call him first and then one or two others and that they did not call the whole pack.

In every dog pack there was one strong, stout-limbed, reliable dog that was called first, as the leader. At least, I think this is the case from recollections which I have of things in my own family. I cannot affirm positively that this was so in every household, but I am pretty sure that in our dog pack we always recognized one particular dog as the leader.

#### SIGNALS FOR CALLING DOGS.

Mr. Wilson has shown me how he used to call birds when he was a boy, by wetting the back of his hand and sucking it with his lips, making a kind of whistling or whinnying noise. We used to call a small puppy in somewhat the same way. The lips were pressed together not so much into a round shape as into a flat or oval shape and the air sucked into the mouth made much the same kind of whinnying or whistling noise. This



noise was made in rapid succession two or three times and followed by a succession of clucking sounds made by doubling the tongue downward in the mouth and drawing it rapidly back and forth against the lower lip, with the mouth partly open, making what you call a kind of half cluck.

#### SELECTING DOGS.

Both male and female dogs were killed if they were surly in disposition or if they were "digging-lodge" dogs. A "digger" was killed just as soon as it was discovered he was developing the habit, for we knew that if a dog dug outside at the foot of the lodge roof, some member of the household was going to die (p. 198). We also killed an "eater" that is, a dog that ate meat from the drying stages, because we feared that such a dog might "eat up" families. I mean that we feared to let such a dog live lest it be a sign that the family would be "eaten up" or destroyed by enemies.

At night, if a dog howled alone, and not at the regular times with the others, we thought it a sign that he was sorry for something that was about to happen in the household.

Of a dog with an out-bulging forehead that was surly and mean and bit people, it was said, "That dog bit someone in that family. It is a sign that someone in the family is going to die."

The dogs of our enemies, the Sioux, were wild and surly. If strangers came near them they barked very much. We feared these wild dogs and if we wanted to approach to attack a Sioux camp, we usually planned to do so before daylight, when everyone, even the dogs, slept. Our dogs were better trained and were not so wild. Those of the Sioux were, I think, very much like the Sioux themselves. They were always traveling about and because of this had slim legs; but it was only in the slimness of their legs that they differed in appearance from our dogs; otherwise, they were very much alike.

A dog two or three years old had acquired his proper strength and was old enough for work. Those that developed surly dispositions were shot. Often a bitch would be very surly and cross before her puppies were born, then the people would say, "That bitch will give birth to many male dogs." We also thought if a mare was savage before the birth of the colt that it would be a male.

To make a dog gentle the woman owner would take up the puppy, spit in its face, and gently rub the saliva over its head and say, "I want to bring this dog up to be gentle."

At night, when the dogs barked and whined the people would say, "Ghosts are around. The dogs are talking with them. They can see

ghosts with their eyes." Whenever they made a whining noise we said that they were talking with ghosts.<sup>1</sup>

Dogs in our tribe were never taught to help in hunting<sup>2</sup> nor were they ever taught to help in herding or driving in horses.

We did not keep our dog skins nor use them for tanning. If a dog died we just threw the body away.

During sacred ceremonies dogs were kept outside of the lodge as it was thought unlucky to allow them to be present. If one came in the people would say, "Drive that dog out!" and would throw sticks at it and drive it out.

No dog was ever allowed near a fishing trap lest it eat the dead animal used for bait. I do not know of any special rule forbidding dogs to come near the fishing trap, but we just thought that no one should take a dog to a fishing trap. A dead dog was never used to bait a fishing trap.

In 1914 Buffalo-bird-woman gave the following:—

Ordinarily, dogs were not eaten, partly because the dog was a sacred animal, and again because the flesh was not good; for dogs fed on carrion and human ordure. Our people did not eat dogs until about forty years ago, when we learned the custom from other tribes, I think the Santee Sioux, who gave us the grass dance. It was the rule that we should eat dogs when we danced the grass dance.<sup>3</sup>

We also knew that all male animals, like the deer and buffalo, were not very good to eat in the breeding season. The flesh then tasted different from what it does at other seasons of the year.<sup>4</sup>

<sup>1</sup>Lewis, writing in the Mandan country, states:—

... "near the (burial) scaffold I saw the carcass of a large dog not yet decayed, which I supposed had been killed at the time the human body was left on the scaffold; this was no doubt the reward, which the poor doog had met with for performing the (blank space in Ms.) friendly office to his mistres of transporting her corps to the place of deposit. it is customary with the Assiniboin, Mandans, Minetares etc., who scaffold their dead, to sacrifice the favorite horses and doggs, of their diseased relations, with a view of their being servicable to them in the land of sperits." (Lewis and Clark, *ibid.*, vol. 1, 323.)

<sup>2</sup>In his account of Mandan hunting methods, Maximilian remarks:—"Dogs are not employed in hunting by the Mandans and Manitaries." (vol. 2, 346.)

Yet of the Arikara we read:—

"It may be here remarked, that horses and dogs are the only animals which the Indians domesticate: of the latter they have two varieties, one of these they employ in hunting; the other appears to be of a stupid and lazy nature, always remaining about the village, and employed as mentioned above." (Bradbury, *ibid.*, 119.)

<sup>3</sup>See this series, vol. 5, 44.

<sup>4</sup>"The Indians frequently eat the flesh of the dog; . . . These dogs are small; and in shape, very much resemble the wolf. The large dogs are of a different breed, and their flesh always has a rank taste; but this is never the case with the small kind." (Harmon, *ibid.*, 281.)

## A HUNT MADE AFOOT WITH DOGS.

The place of the dog in Hidatsa culture may be concretely presented by adding a specific narrative of a hunting trip on which dogs alone were used. Though this hunt occurred about 1870, it can, with due allowance, be taken as typical of prehistoric days, before the horse and the gun were known. The narrative that follows is by Buffalo-bird-woman and was related in August, 1913.

*The Hunting Party.* After I married Son-of-a-star, but before Good-bird was born (I was about twenty-nine or thirty years old) I went on a hunt up the Missouri River. We started in the spring, about the last of March, or the first of April. There were six men and their wives in the party: Crow-flies-high and Oke-wiac, or, Head-plume-woman, his wife; Bad-brave and Sioux-woman, his wife; High-back-bone and Bloss-

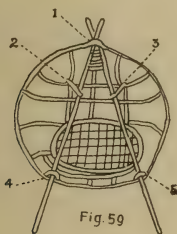


Fig. 59

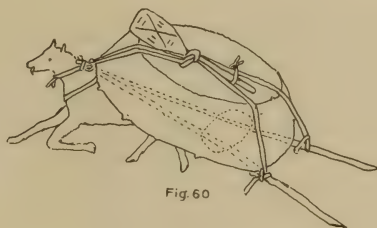


Fig. 60

Fig. 59. Diagram to show how a Bull-Boat was lashed to a Dog Travois. The boat is represented lying mouth upward, with the travois laid across its mouth. At 1, 4, and 5, short thongs bind the travois poles to the boat ribs close to the rim. At 2 and 3, longer thongs fasten the poles to ribs in the bottom of the boat. The boat is then turned over as in Fig. 60.

Fig. 60. Dog carrying a Bull-Boat as a Travois Load.

som, his wife; Long-bear and his wife, an Assiniboin woman whose name I have forgotten; Ídu-tsa-tsa-hic, a Dakota, and Bird-woman, his wife. The Dakota Indian's name is a Mandan word, meaning "scar." My husband and I completed the party.

As the horses were not in condition to stand the strain of travel over the soft and muddy ground and the swollen rivers and creeks, we went without them and carried our baggage on dog travois.

I had three dogs: The first Náaka-kidukic, or Packs-her-baby, was a castrated male, a large, long-tailed, black dog so named by my father, Small-ankle, who in battle had once struck a woman who carried a baby on her back. On this dog was loaded a bull-boat tied over the



travois basket with one edge resting upon the travois saddle. A special thong, or rawhide rope, was tied around the place where the travois poles met, and drawn double to the top of the boat. At this point, the bull-boat paddle was made fast in a knot, then the thongs were parted, each end descended over the boat and was tied to the travois poles behind. At the forward end of the boat, two thongs were made fast to a rib on either side of the frame and descending, were lashed to the travois poles as shown in Fig. 59. The boat strapped to the dog's back is shown in Fig. 60.

My second dog, named Měě'tsi-kudæc, or Knife-carrier, was a castrated male, black, long-tailed, the brother of Packs-her-baby. He was named Knife-carrier by Small-ankle because one time in battle a man with a knife in his hand pursued the Hidatsa and was shot and killed by Small-ankle. Knife-carrier carried two half tent covers on his travois.

My third dog, Måada-nútsic, or Took-a-scalp, was also a castrated male, white with large black spots. He carried two half buffalo robes for bedding, three pairs of moccasins for myself, five for my husband, an ax, a tin pail, a tin cup, and a toothed gun-barrel flesher. As pillows were too bulky to carry, we left them behind; besides, if needed, we could make one by heaping up some dry grass and covering it with a robe or blanket.

The other members of our party took the following dogs with them:—

Head-plume-woman, two dogs; Sioux-woman, two dogs; Blossom, two dogs; the Assiniboin woman, three dogs; Bird-woman had no dog and packed her baggage on her back. The rest of us who had dogs carried no bundles.

As Blossom and Head-plume-woman each had one bull-boat, we carried three altogether. Each bull-boat was bound, mouth down, upon a dog travois, as I have already described.

The men carried their guns, but no bows nor arrows; only mounted hunters used arrows for killing buffalo at this time. Deer and antelope were shot with guns only; but my father told me he once killed a deer with an arrow, and another Indian, named Fire-above, I remember, also killed a deer with an arrow.

*Dress.* On the hunt, my husband, Son-of-a-star, wore buffalo skin moccasins with the fur inside. To reinforce the outer sole, a second sole of tent skin was sewed to it; ankle flaps, also of tent skin were sewed to the tops of these moccasins which were for winter use. As they were to be

used in hunting, these moccasins were unornamented. The lacing strings were of buckskin. In Fig. 61 is a sketch of the moccasin made under my direction by my son, Goodbird. Fig. 62 presents the moccasin pattern. In the old days, we did not make the modern heavy-soled moccasin which I think we learned to make more recently from the Sioux.



Fig. 61

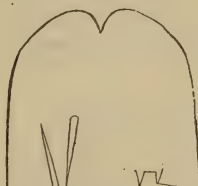


Fig. 62



Fig. 63

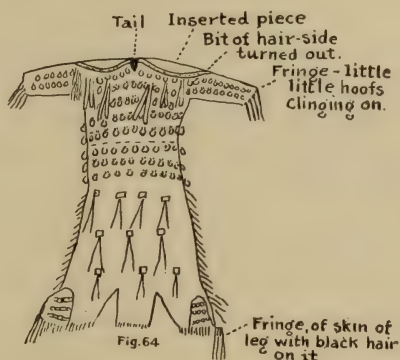


Fig. 64

Fig. 61. Type of Unornamented Moccasin worn on the Hunt in Winter.

Fig. 62. Moccasin Pattern.

Fig. 63. Coat worn by Son-of-a-star, during the Hunt Afoot.

Fig. 64. A Rocky Mountain Sheepskin Dress decorated with Elkteeth.

My husband's leggings were of old tent skins. They had no fringe, but were sewed down the side with a three-inch edge, with short buckskin thongs at close intervals. In old times we wore the same leggings in summer and winter. As my husband's leggings were for use in hunting, they were unornamented.

Son-of-a-star wore his shirt of plain white sheeting outside of his buckled leather belt of white man's make. His clout was of blue cloth with a white edge. He wore a buckskin overcoat which I made of three deerskins and measured after a soldier's overcoat. On the breast and

back I ornamented it with beadwork, in duplicate patterns which were duplicated on the back, and placed beaded bands around the wrists. It had pockets on each side. Fig. 63 shows a pattern of the coat and the beadwork. Over this coat, Son-of-a-star wore his belted buffalo robe. This second belt was an ammunition belt full of forty-four Winchester shells. The robe was worn with the fur inside and the head of the robe on the left and the tail on the right. In putting on the robe, one measured by drawing it up so that it covered the head. Then the legs were spread

wide apart and the robe folded, right side first, over the front of the body. The left side was then folded over and the belt drawn around the middle. The reason for spreading the legs apart was to make sure that when the robe was belted about the body, the skirt would be wide enough to walk in. His gun and cleaning rod he carried on his left arm.

A good robe had a piece cut out of each shoulder and was then sewed up again to make it more symmetrical (Fig. 65). The skin of a two-

year-old bull made the best robe. Fig. 66 is a sketch of my grandson, made by Goodbird, showing a front and back view as he posed with a small calfskin wrapped about him, in the proper mode of the old days. It will be noted that while the robe is folded about the body with the head to the left, when it is finally belted, the head lies on the right side.

I also wore a buffalo robe; but it was the old custom for a woman to wear her robe with the head and a little bit of the tail folded so as to show the hair. Besides, I wore a buckskin dress<sup>1</sup> and leggings of tent skin. My rawhide belt was drawn around my dress and tied. I wore winter moccasins like those of my husband, but, of course, smaller in size. In cold weather, both men and women drew the buffalo robes over their heads. I wore a second rawhide belt over my robe. My buckskin dress was of two deerskins, sewed together, head down. The heads were trimmed off at the neck and the sleeves made by sewing together the hind legs of the two skins. The skirt reached to about three inches above the ankle.



Fig. 65



Fig. 66

Fig. 65. Sketch of Buffalo Robe to show Notches cut out at Shoulder to make it more Symmetrical.

Fig. 66. Front and Rear Views to show Proper Method of wearing a Buffalo Robe.

<sup>1</sup>For comparative data on these types, see this series, vol. 17, part 2.



Fig. 64 is a sketch, drawn under my direction, of a dress which I once made of Rocky Mountain sheepskins.<sup>1</sup> It was very a rich garment and has six hundred elkteeth.<sup>2</sup>

*The First Camp.* The first evening we camped at a spring at Timber-facing-across-river. The women set up a frame for our camping tent of forked ash, elm, and box elder sticks, joining them at the top, like the framework for a tipi. The cover was of pieces of tent skins, each family contributing one piece or more. I brought two pieces. The tent was large enough for all twelve members of the party.

While the woman set up the tent, Crow-flies-high and Bad-brave went out to hunt. They killed an elk and brought in as much of the meat as they could pack on their backs.

As it was still early spring and the weather chilly, the hunters wore their robes as usual. Even in early summer, the hunters took a light robe with them, but in the hot months this was unnecessary. Even in midsummer, when on the hunt, the hunter wore his buckskin shirt.

Fig. 67 illustrates the method of bringing meat into camp. In this case, Crow-flies-high and Bad-brave brought back the two sides of the elk with the ribs and the two hams with the tough outer meat removed. In Fig. 67 the meat shown on the back of the hunter is also a side with the ribs. To carry such a load, the hunter turned his robe fur side in, and bound it about his body with his belt, the tail hanging down. The head and neck of the robe were turned back over the shoulders and back so the fur side was out. As will be noted in the sketch, the side of meat was suspended across the shoulders by a thong or pack strap cut from the green hide of the slain animal. A thick pad of grass was laid on the exposed fur of the buffalo robe to protect it from any juice that might sleep through from the freshly killed meat.

*Roasting Meat.* The two sides of elk brought in by Crow-flies-high and Bad-brave were roasted over the fire by Bad-brave and High-back-bone. They thrust a long stick through the meat and standing on either side of the fire, slowly swung the meat from side to side. When the flesh side was well roasted, they turned the rib side toward the fire and swung that back and forth until it too was cooked. It took a long time to roast

<sup>1</sup>Buffalo-bird-woman consumed an entire half day in describing this dress and getting the sketch made to suit her. She evidently took great pride in its description and the sketch was only approved after every detail had been worked out to her satisfaction.—G. L. W.

<sup>2</sup>In 1910 Buffalo-bird-woman said, "Six times in my life, I have owned elktooth ornamented dresses. Once I had a dress with six hundred elkteeth on it.

A blind Mandan man on this Reservation makes artificial elkteeth from the leg bones of oxen. These bones, we Indians think, do not decay as do the other parts of the ox's skeleton. This man can make five artificial teeth in a day. He saws out the pieces and works them to shape with file and sandpaper. He tests the smoothness and accuracy of his work by touching the bits of bone with his lips and the tip of his tongue."

the two sides of the elk. That night we ate only the roasted meat, drinking neither coffee nor broth.

*The March.* We moved camp the next morning.<sup>1</sup> Our route lay along a trail that skirted the foothills along the river; we always used this trail when we went on a hunt up the Missouri River. Our order of march



Fig. 67



Fig. 68

Fig. 67. How Meat was carried into Camp on the Hunter's Back.

Fig. 68. Moving Camp: the Order of March.

is indicated in Fig. 68. At the head, marched the three leaders walking together; then followed a man and his wife, walking side by side, and chatting. Three dogs with their travois, followed in single file, as dogs are trained to go. Then came another woman, the wife of one of the leaders, followed by her three dogs. Next walked a man and his wife,

<sup>1</sup>Catlin, in the course of a vivid description of striking a Sioux camp says:—

"... in the rear of this heterogeneous caravan at least five times that number of dogs, which fall into the rank, and follow in the train and company of the women, and every cur of them, who is large enough, and not too cunning to be enslaved, is encumbered with a car or sled (or whatever it may be better called), on which he patiently drags his load—a part of the household goods and furniture of the lodge to which he belongs. Two poles, about fifteen feet long, are placed upon the dog's shoulder, in the same manner as the lodge poles are attached to the horses, leaving the larger ends to drag upon the ground behind him; on which is placed a bundle or wallet which is allotted to him to carry, with which he trots off amid the throng of dogs and squaws; faithfully and cheerfully dragging his load 'till night. . . ."

(Catlin, George, *Illustrations of the Manners, Customs, and Conditions of the North American Indians*, London, 1848, vol. 1, 45).

followed by two dogs; then another man and his wife, in single file, their two dogs following. Then came two more women in single file; two dogs brought up the rear of the procession. The diagram (Fig. 68) is, I think, a typical representation of a day's march. The leaders always walked first; each family, or if the husband was one of the leaders, the wife, followed in line just ahead of the family dogs.

It will be noted that two of the men are shown walking with their wives. This was a common occurrence. If a husband and wife were not talking together, the husband went ahead and the wife followed, but if they were chatting or wished to converse about anything, the husband joined his wife and they walked side by side. You say that when a white man walks with his wife upon the sidewalk in the city, he thinks it is polite to walk on the side next the road. We had no custom like this among our Indians in old times. A man walked with his wife on either side, as might be convenient. If a man were not talking to his wife, he walked in front of her. I do not know why this was done, but it was our old-time custom and we always followed it. We were quite a jolly crowd. As we moved along, we talked and laughed, and told amusing stories.

The trail led over the brow of the bluffs that overlooked the timbered bottoms along the river. Anyone who has traveled up the Missouri River will understand what I mean. This was a fairly well marked trail since it was used by our hunting parties, ascending and descending the river, by travelers, and perhaps by buffalo herds. There was sufficient travel over the trail to form a perceptible road.

*The Second Camp.* Our second camp was made at the Slides, at a spring about half a mile in the Bad Lands. The men killed a buffalo bull so we had an abundance of meat for supper and breakfast the next morning. For supper, we had a kind of blood broth which I prepared.

*Blood Broth.* Into a pail that could hold about three gallons I poured a gallon and a half or two gallons of blood from the buffalo bull. To this I added one cup of water, a piece of buffalo fat about twice the size of an egg, and about a double handful of boiled dried squash. Before putting the pail on the fire I added the marrow from the buffalo leg bones.

I cut a section of the trunk of a small chokecherry sapling about two feet long and stripped the bark toward one end, letting the strips cling an inch or two at the end and tying them into a ball or knob. I used this stick as a paddle, for as soon as the broth began to boil it needed constant stirring, lest it spoil. The bark knob on the end of the stick not only aided in stirring but also imparted a cherry flavor to the broth.



I cut another stick and peeled it quite free of bark. I thrust this into the broth from time to time to see if it were done. If the blood clinging to the stick when it was withdrawn was still red, it was not done; but if the stick looked clean and white, the broth was ready to serve. When ready, the broth looked brown instead of red as at first. As it was a delicate dish<sup>1</sup> it would spoil if kept too long on the fire.

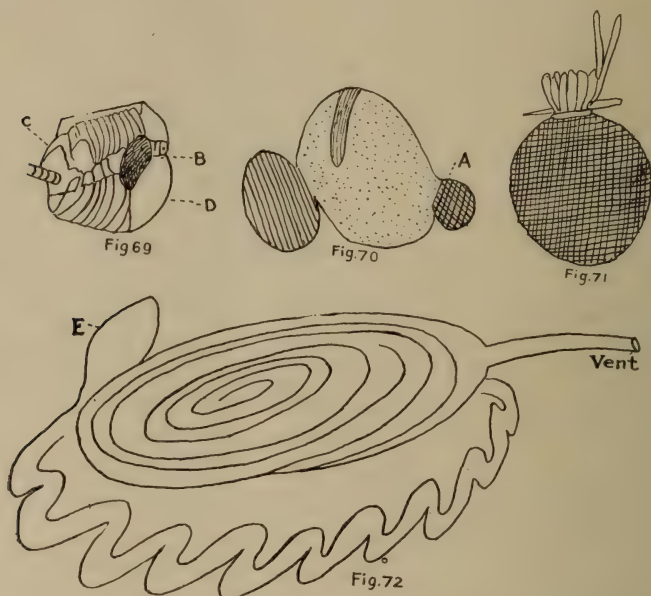


Fig. 69. Sketch of exposed Buffalo Breast to show where Blood for Blood Broth was obtained.

Fig. 70. Sketch of a Buffalo Paunch.

Fig. 71. Bag made from Part of Paunch and filled with Blood.

Fig. 72. Sketch of Buffalo Intestines.

The blood to make this broth was obtained as follows:—Fig. 69 is a sketch, made by Goodbird, of the exposed breast of a freshly killed buffalo; Fig. 69C shows the heart with the lungs beneath; Fig. 69D is a membrane lying between the lungs and the intestines, called *núti-coki*, or ribs-front, meaning something in front of his ribs; the black spot (Fig. 69B) represents a pool of blood that always collects here and is held at this place by the membrane.

<sup>1</sup>For further discussion of this peculiar method of preparing soup see this series, vol. 5, 26–27.



Fig. 70 presents a rough sketch of a buffalo paunch. The inside is covered with little cells which we call "hairs." On these divisions of the paunch these cells lie square (sic). The section marked A (Fig. 70) was cut off, the contents shaken out and the sack turned wrong side out. Now one man held the mouth of the sack open while another scooped the blood from the carcass with his two hands joined together like a cup. The clotted blood was thrown away since it was difficult to cook and was likely to spoil the soup. When the bag was filled, a stick was skewered back and forth through the edges of the mouth; these were gathered together beneath the skewer and bound with a sinew (Fig. 71). Thus tied, the sack of blood, could be hung on the saddle by a thong or borne home by hand. In thrusting the skewer into the mouth, I gathered the two edges together, folded them back and forth, and thrust the skewer through these folds. This drew the two edges of the mouth together very much as when we sew two pieces of skin together.

In the summer time we made a kind of blood pudding. I presume this might have been made in the winter, but I never did it myself, as it was much harder to cook.

*Blood Pudding.* Fig. 72 presents a rough sketch of a buffalo's intestines with the vent marked. What we call the "crooked" intestines lie outside of the mass with the "straight" intestines within. E marks the end of the crooked intestines. This is a sack filled with dung and water. This sack was removed, turned inside out, and the outside surface cleaned by rubbing on the prairie grass. Of course, this outer surface had previously been inside and was fouled by the contents of the sack. This sack was now filled with blood from the breast of the buffalo, as in the case of the paunch, and skewered in the same manner. As previously stated, only the thin and not the clotted portions of the blood were taken.

Before the sack was tied, the three leg bones of the slain animal were cracked at the butchering place by striking them against one of the buffalo horns. The marrow was extracted with a knife, an arrow point, or a cleaning rod, and added to the blood. If they were in season, some ripe juneberries were also added.

At the camp a fire was made. When it had burned down, the coals were pushed aside, leaving a bed of hot ashes upon which the bag of blood was laid with the mouth tightly closed. A man rolled the bag back and forth over the ashes with a stick so that it would not burn. The stick was not fastened to the bag in any way. When the outside of the bag became crisp and charred, it was taken out and allowed to cool. Then the mouth was cut open.

This pudding was very good. A man would take a spoon and eat from the opened sack, crying, "Aha-héy! sákits!" "Hey! Good!" Then he passed the bag to the man next to him, and so on around the circle. When it was the women's turn, we emptied what was left into a bowl, threw away the sack, and all ate together. We used either a buffalo horn or some other kind of spoon.

The scene I have described might take place either in summer camp or in an earth-lodge. The men ate before the women, for it was customary when a man had his favorite and finest foods cooked, to call in perhaps five or ten of his friends. He was thought to be very ungenerous if he did not invite his men friends. For this reason, the men ate first, since they were guests. They usually left some of the pudding for the women, perhaps a quarter or more of it. If my husband called in some of his friends to eat a blood pudding and they left me a quarter of it, I might either eat it myself or else I called in some of my women friends. If a man or a woman ate his best foods alone, the people said, "That is a bad man," or, "That is a bad woman," but if he or she invited his friends, people would say, "That is a good man," or "That is a good woman."

*Ownership of Slaughtered Game.* When game was killed and brought to the household the meat and skins belonged to the women, never to the men. We might share these with our parents and relatives or friends, or do with them just as we pleased, since they belonged to us.

*Story Telling.* In the evening, we built a big fire in the tent to light it up, sat around it, and told stories. One man usually told the story while the rest listened and laughed. We told stories of traveling, of war parties, or of men or people who did unusual things, either good or bad; but generally the women did not talk much. We sat and talked until quite late, perhaps about eleven o'clock, and then we retired to our beds.

*Third Camp.* We arose before sunrise the next morning. As soon as breakfast was over, the men started out to hunt. As we had killed a buffalo bull the day before, we thought there might be herds in our vicinity. The men spent the whole morning searching for signs of the presence of buffalo, but found none. Early in the afternoon, we broke camp and went on about five miles, making camp again on the south side of a lake lying in the timber near Shell Creek.

There was still snow on the ground and the ice in the Missouri began to break up the day we killed the buffalo bull.

*Fourth Camp.* The next morning we moved on again and in the evening camped at Deep Creek.

*Meals.* When on the march we did not stop for a meal at noon, but ate at any, or all the time, if we were hungry. We carried with us plenty

of cooked meat for our lunch and ate whenever we were hungry. If either my husband or I became hungry, I opened my lunch bag and distributed the food so that each member of the party got a share.

*Feeding the Dogs.* On the march we fed our dogs and were always considerate of them. When the rest of us ate lunch, the dogs also ate. (See pp. 201-202.)

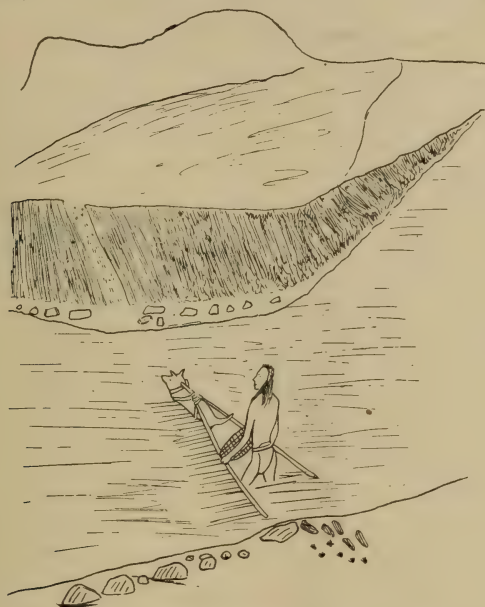


Fig. 73. Assisting a Dog to swim a Creek.

*Dogs Crossing a Creek.* If our dogs needed to cross a creek too deep for them to ford easily, one of the men waded into the water and held the rear end of the travois out of the water while the dog swam across (Fig. 73); in this way, the objects carried on the travois basket were kept dry. The man raised the two ends of the travois poles very much as a white man lifts the handles of a plow.

*Unloading the Dogs.* In the evening, when we arrived at camp, the travois were removed from the dogs, the baskets unloaded, and the travois stood up on end with the smaller ends tied loosely at the top, by their neck collars, like the framework of a tent (Fig. 74). They were set up in this fashion so that they could be kept dry, for if a rain came up, the wind soon dried them again.<sup>1</sup>

<sup>1</sup>See p. 220.

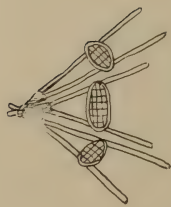


Fig. 74



Fig. 75

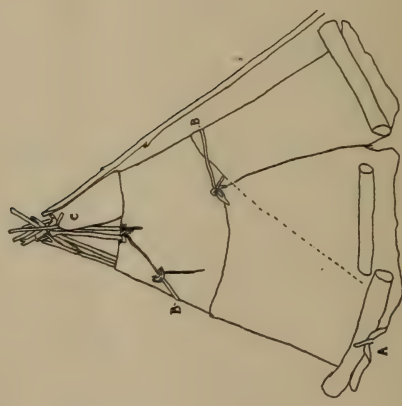


Fig. 76

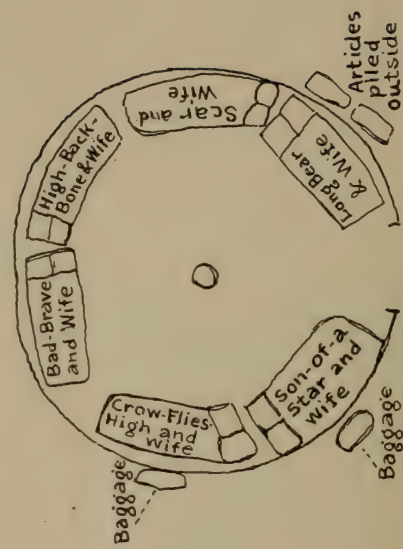


Fig. 77

Fig. 74. Travois stacked for the Night.

Fig. 75. Construction of Bed used in Tent on the Hunt.

Fig. 76. The Skin Tent. A, tent pin here driven into the hard ground to prevent log from rolling off the edge of the tent cover; B, B, rawhide thong drawn around the tent to firm it; C, Saddle skin placed as a wind shield to prevent smoke from blowing down the smoke hole.

Fig. 77. Position of the Beds within the Tent.



In the morning, each dog was harnessed to his own travois, as it was our custom never to interchange the travois belonging to the several dogs.

*Water for Dogs.* I never carried water for my dogs, although I heard that other people carried it with them in buffalo paunches. I have heard that the Assiniboin often did this, and though I never saw it done in my own tribe, it is quite likely that this custom was sometimes followed. (See p. 225.)

*The Tent.* The tent we used on this hunt was set up anew at each camp with a framework of freshly cut poles. We always pitched the tent in a rather open place in the timber and on rising ground, a knoll or ridge, where the snow was not so deep. I had brought with me the only hoe in camp and with this I scraped the snow off the ground.

The foundation for the tent framework was of four forked poles, the tops interlocking at the forks.<sup>1</sup> Then an additional half dozen unforked poles were cut with which the circle was completed.

The tent cover consisted of six pieces of skin, each one and one-half or one and one-quarter hides in size, and roughly rectangular in shape. The four corners of each of these rectangular pieces were pierced so the skins could be tied together in a series. Each woman contributed at least one piece of skin toward the completion of the tent. The tent poles were covered in two sections: an upper and a lower series of skins. The lower series was put on first; at intervals, the upper edges of the skins of this series were tied to the tent poles to stay them. The upper series was put on in the same way, but overlapped the lower series like shingles on a house.

As will be noted in Fig. 76, the door, too, was made to overlap, as shown by the dotted line. To enter the tent, it was necessary to raise this door flap and step over the overlapped portion.

Since the ground was still frozen, tent pins could not be used; instead, small logs were laid along the bottom of the tent upon the edge of the tent skins. For greater security, one or two of these logs was held in place by laying them upon the edge of the tent cover, turning the edge of the cover over the log, either wholly or partly, and inserting a tent pin in the ground. A shallow hole was dug in the hard ground with an ax and the peg driven in, as will be noted to the left of the tent shown in the illustration (Fig. 76A). To secure the tent still further, a rawhide thong is tied just above the door, passed around the tent, and then tied to the top of one of the exposed poles (Fig. 76B).

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<sup>1</sup>For a general statement of tipi structure and distributions for the different types see this series, vol. 21, 222, and vol. 5, 108-117.

In windy weather, a saddle blanket of buffalo belly skin was put up on the windward side of the smoke hole where it was held in place by a forked stick, one prong of the stick being thrust through two apertures cut in the skin (Fig. 76C). Its purpose was to prevent the smoke from being driven into the tent by the wind.

Blossom, Crow-flies-high's wife, and the Assiniboin woman, as well as I, had brought axes. The men carried no hatchets.

*Pipes.* Crow-flies-high and High-back-bone carried pipes in their tobacco bags together with tobacco or some other smoking ingredient. The tobacco bag was tied to the belt on the right side.

*The Campfire.* During meals we sat in a circle around the fire and facing it, each man with his wife. The food bowls from which we ate were placed before each couple. We had no fixed places in front of the fire, but sat wherever we were inclined.

*The Beds.* There was a bed for each couple in the tent, six in all. They were placed head to head and foot to foot. As one entered the tent, the first bed on the right was that of Long-bear and his wife; next, was that of the Sioux, Scar, and his wife; then followed in order the beds of High-back-bone and his wife; Bad-brave and his wife; Crow-flies-high and his wife; and finally, that of Son-of-a-star and myself. There was no particular reason for this order, except that this was the arrangement at the first camp, and these places became fixed so that when we made camp, each couple put their bed in the same place (Fig. 77).

Fig. 75 is a sketch of one of these beds made by my son, Goodbird. A small log was laid parallel with the wall of the tent and pinned in place by small stakes driven into the ground. Grass was cut with our hoe and heaped on the floor between the log and the wall of the tent. Over the grass were laid two buffalo robes, fur side up. A third, was folded, fur side out, for a pillow and laid at the head on a grass cushion. The object of the log was to keep the grass from working out from under the bed and to prevent sparks from setting fire to the grass. The husband always slept on the side toward the fire.

*Arrangement of Baggage.* Guns were tied to the tent poles, stock down, each gun over the bed of its owner. Other packages, especially those not easily damaged, such as packages of dried meat, fat, or buffalo intestines, were placed outside of the tent along the edge of the tent cover as shown in Fig. 77.

*The Dogs' Sleeping Place.* The dogs slept wherever they chose, sometimes near the tent, sometimes farther removed. The dogs belong-

ing to one family sometimes slept together. However, all the dogs of the camp never slept together in one place as one pack. (See Kennels, p. 202.)

*Leaders.* As this was only a small hunting party, there was no regularly chosen leader; but, as I have said, on the march, two or three men always went ahead of the party.

*Buffalo Hunting on Deep Creek.* The day after we pitched camp at Deep Creek, the men of our party discovered that buffalo were crossing the Missouri River from south to north, about five miles from our camp.

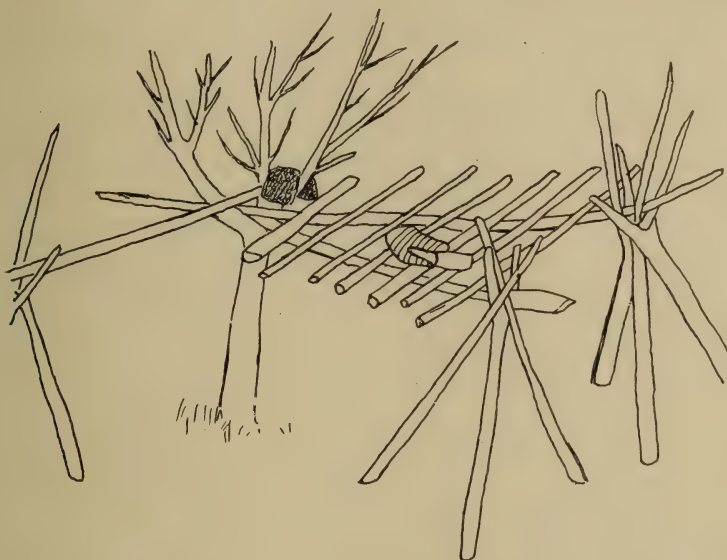


Fig. 78. The Meat Drying Stage.

The hunters waited on the bank until the buffalo landed and in this way killed five fat cows. The women remained at the camp. When the hunters discovered that the herd was crossing, a great number had already landed so that part of the herd was on either side of the river.

The men cut up the buffalo and put up stages on which they placed the meat. Such stages were made about five feet high, so as to be out of reach of the wolves. Usually, the hunters looked for an elm tree, a box-elder, or ash, with the limbs branching out in a fork about five feet or a little more from the ground. When such a tree was found, they gathered up some dead and dry forked limbs and put up the other two or three supports for the platform (Fig. 78). Of course, the platform shown in



Fig. 78, is not exactly like other hunters' platforms which were put up very rudely. If possible, the hunters used a tree as one of the supports for the stage; they made the others of dead and dry forked poles. In Fig. 78 is a sketch of the meat stage constructed at Deep Creek as I recollect it. It was strong enough to keep its position without having the supporting posts thrust into the ground. Meat was laid not only upon the platform, but was hung upon the tops of the forked poles and in the branches of the tree. I remember that the hides were not laid on the platform proper, but were folded over the limbs of the tree as in Fig. 78. Goodbird has only drawn two pieces of meat lying on the platform, but of course, when the hunters left the stage the platform was piled full of meat.

Sometimes, to protect meat from wolves and coyotes, hunters stuck a cleaning rod in the ground with a cloth tied to it.

*Cuts of Meat.* We cut up a buffalo carcass according to a regular plan. The various cuts of meat, as I now recollect them, I will name in my own language. I give those I can remember, but there are probably others which I do not at this moment recollect. I have no carcass of a steer at hand in which I can point out the cuts and it would be difficult for me to describe them clearly.

The following are the names of the larger pieces:—

|                        |             |
|------------------------|-------------|
| Ici'taduka             | Du'ta       |
| Ici'tadutapa           | Matsu'adu   |
| Idikoré'ëxi            | A'da        |
| Ici'tipitsëtsë         | A'dapahu    |
| I'dikaduidu'           | Kidi'ki     |
| Itsi'dupakua a'du idu' | Natidapa'   |
| Na'tiduka              | Naxáxi      |
| Icu'taduidu            | Ici'tidu    |
| Ici'takakeu'i          | Kidi'kaputi |
| Edika'sa               | A'padupa'ta |

The following are the names of the smaller cuts we recognized:—

|                  |             |
|------------------|-------------|
| Itawi'dica       | Adu'a       |
| Ada'ei           | Mitëduwa'ta |
| Itawidaktsi'hë   | Napi'tutsu  |
| Tsëcai'kipa'caki |             |

*Flaying of Hides.* The hide of a one or two year old buffalo was taken off whole; that of an older animal was slit down the back. When put on the stage, it was folded flesh side in, with the edges turned in, as shown in Figs. 79. This was only a temporary provision. Lest it begin

to spoil, a green hide should be stretched to dry the second day after it is removed. A hide was folded, as shown in Fig. 79, merely for storage over night on a stage, or for transportation to the tent to be fleshed and dried the next day.

*The Choice Pieces.* After the hunters had placed the hides and the greater part of the meat from the five cows on the stage, they returned to the camp, packing some of the choicer cuts on their backs. Usually, these were the tongues and kidneys and the meat on the breastplate bone. They brought in only the choicest pieces because we already had a good supply on hand.

*How the Cuts were Slung.* Since we had no horses with us on this hunt we naturally could not transport any of the large cuts of buffalo meat on horseback.<sup>1</sup> Usually, the larger cuts were packed home on horseback by binding together with a thong two cuts of about equal weight, in such a way that they could be slung over the horse's back. Each of the larger cuts was always pierced in a special place to receive the thong, which consisted of a piece of green hide about two feet long, cut from the slit edge of a half hide. In Fig. 80 is shown the tie by which the smaller cuts were fastened to the thong. A long slit was cut in one end of the green thong. This slit end was then passed through the hole pierced in the cut of meat and the end drawn upward and passed through the slit above the piece of meat. Then it was drawn through far enough to permit the cut of meat to be passed through the slit (Fig. 81). Finally, the thong was drawn, completing the knot.

For the larger cuts of meat, such as a side with the ribs in it, slits were cut in each end of the thong, as previously described. Through a



Fig.79



Fig.80

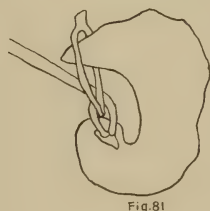


Fig.81

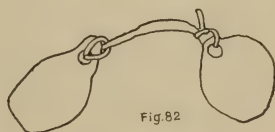


Fig.82

Fig. 79. A Green Hide temporarily folded before Fleshing.

Fig. 80. Method of fastening Meat to a Thong of Green Hide for Transportation.

Fig. 81. How the tie shown in Fig. 80 is made.

Fig. 82. Two Pieces of Meat tied together for Transportation.

<sup>1</sup>For additional data on these points see vol. 5, 42.

hole pierced in one of the two pieces, the slit end is drawn and looped by drawing the entire thong back through this slit. Consequently, the second cut was merely pierced, the thong drawn through, and tied. Fig. 82 is a rude diagram explaining this tie.

*The Fifth Camp.* The next morning, we crossed the Missouri about four miles further up the river at an open place where grew a few scattered willows. Both the men and women set to work to cut a path through the willows for the travois. Then we loaded the travois and the dogs dragged them to the river's edge. We had two bull-boats besides my own to use in ferrying our equipment over. These belonged to Head-plume-woman and Blossom (or Squash Blossom, as it should be translated, though we usually say Blossom).

*Ferrying over the Missouri by Bull-Boat.* My husband and I loaded our bull-boat and pushed off, the dogs swimming after us. We bound our three travois, piled one upon the other, to the edge of the boat by a short thong attached to the saddle of each travois by a large loop in such a way that the saddle projected upward over the boat. The lower travois basket was immersed in water, but the upper ones were hardly wet. I paddled while my husband sat in the back of the boat. (See pp. 271, 285.)

Our object in crossing the Missouri was to find buffalo. As I have remarked, only part of the herd had crossed the river, so the hunters said, "We think there are more buffalo on the other side." When we arrived at the opposite shore, my husband and I unloaded our boat and loaned it to one of the other families; I have forgotten which one. The members of the party crossed the river, bringing over all their possessions in two trips. As it was but a short distance from shore to the new camp, we ourselves carried everything up the bank and did not put the travois on our dogs.

Now a dispute arose among the members of the party. The hunters wanted to abandon the meat from the buffaloes they had killed the day before, saying, "There is better hunting on this side. Let us kill buffalo while we have an opportunity and abandon the meat we have staged on the other side of the river." We did not find signs of buffalo as plentiful as we had expected and the men began to argue, "We had better return for the meat we staged."

The next morning, we crossed the river again, with our dogs and travois. The first trip three of us crossed in a boat, returning for the other members of the party. It was about three quarters of a mile from our landing place to the spot where the meat was staged. We made one



trip to the stage, bringing back all the choicest meat, loading it partly on the travois and partly packing it ourselves. We made several trips across the river for the meat, but I do not recollect how many. Both the men and the women in the party helped pack the meat to the boats, we women using our pack straps while the men used rawhide ropes we had brought with us.

I have described how the elk was packed to our camp (Fig. 67); buffalo meat was transported in the same manner, except that the men used dried rawhide ropes and the women, pack straps. I packed an entire cow hide, cut in two pieces, in one load.

We reached camp with our last load in the early afternoon and spent the rest of the day busily building our stages, placing our meat on them, and staking out our hides for drying.

The next day, the wind shifted to the west so we knew the buffalo could not smell the smoke of our campfires. We also built a fire under the stages to smoke our meat. My own stage was a platform of poles set upon four staves for posts; each support was a kind of tripod, made of three forked poles.<sup>1</sup>

*Killing and Butchering.* The next morning, we saw buffaloes scattered thickly on a bluff on the south side of the river about a quarter of a mile away. The men immediately set out afoot to follow them. In camp, the evening before, we had been very careful to make no unnecessary disturbance, chopping no wood, and silencing the dogs when they barked. About noon, after we had made another crossing for some more of the meat we had left on the drying stages on the other side of the river, the men started on the hunt. Soon we heard shots, Bang, bang, bang, bang! The buffalo were so close we could see the men fire their guns. Of course, they all aimed at fat cows: some killed two, some only one. In a short time, however, the buffalo were frightened by the reports of the guns, and fled, disappearing over the bluff, away from the river.

The hunt took place on a bit of bad land formation so frequently found on the Missouri River. Our hunters crept up on the herd, slipping up ravines and hiding behind knolls or swells in the land, taking advantage of anything that would hide them from the view of the buffaloes.

As the weather was still cool, our hunters set out with their robes belted about them. When they returned, each hunter packed a load of meat on his back (Fig. 67). Only the choice cuts were brought back in this fashion: the tongues, the kidneys, and the ham bones for the marrow;

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<sup>1</sup>The foregoing was related by Buffalo-bird-woman in 1913; the following portion of the account was related in August a year later.—G. L. W.

the rest of the meat was left behind on the meat pile. Some of the ribs with the meat clinging to them were also brought in. A hole was cut through the kidneys and the tip of the buffalo tongue through which a strip of green hide was strung to carry them. The men returned while the sun was still an hour or two high. We were glad to receive them and to see that they had had such a successful hunt.

Our camp consisted of a single skin tent as described in Fig. 76. The following morning we went, with our dogs and travois, to bring in the meat left behind by the hunters. When we arrived at the butchering place, I saw that a stick on which a piece of white sheeting (the head cloth of one of our hunters) had been tied like a flag, had been thrust into the ground to frighten away the wolves.



Fig. 83. The Meat Pile and its Contents. 1, The meat pile covered with the skin; the meat lies upon another skin laid upon the ground, flesh side up. 2, The cloth flag flying from a gun rod. 3, The skinned head and neck with tongue removed. 4, The rejected ends of the legs, skinned. 5, The lungs, heart, and windpipe; the heart was sometimes taken and sometimes rejected. 6, The liver. 7, The backbone. 8, The guts and stomach, both rejected.

In order that they might not be seen when raising their heads above the sky line from behind a hill, it was customary for hunters and warriors to wrap a piece of white sheeting around the head. This cloth was usually gray or yellowish gray as it became somewhat soiled by use. It was one of these head cloths that had been tied to the stick. Formerly, before cloth was obtainable, hunters or warriors wore buffalo skin caps,

in winter, fur side in; in summer of skin from which the hair had been scraped. I do not know whether a Hidatsa hunter in very old times ever tied a skin around his head like a kerchief. This custom apparently became common after we obtained white sheeting from the Whites. All our stories relating to old-time customs tell only of caps worn by hunters and warriors.

Although they were skinned almost to the hoof, the ends of the four legs up to the joints were cut off and thrown away. The head was skinned, the tongue taken, and the rest of the head discarded; the flesh on the neck was also rejected because of its toughness. If fat, the entrails were saved; otherwise, they were thrown away. When they were kept, they were emptied of their contents by being drawn through the hand and compressed by the thumb and fingers.

Goodbird has drawn a sketch of a meat pile as he has observed his father, my husband, make it (Fig. 83). It will be noted that the meat lies on one hide and is covered by another. The pile contains the meat of two buffaloes. The shape of the pile as here drawn is caused by the ribs and leg bones lying underneath the overlying skin.

In winter, when the snow lay on the ground, the hunters dug a hole in the snow, put the meat in it, and covered it with a skin. Then a cloth flag was tied to a stick and driven into the pile to keep the wolves away. Very commonly, when hunters were butchering buffaloes, wolves, coyotes, and kit-foxes sat around at a distance on their haunches, like dogs. As long as the flag waved over the meat, they did not approach, but as soon as the meat pile was removed, they ran forward at once to seize the rejected pieces. I have seen as many as ten or twelve of these animals sitting in a circle while the hunters were butchering; indeed, they appeared almost every time a killing was made, keeping just out of bow shot. All these animals were much bolder and more numerous when I was young. One time when we were camping, a kit-fox came into the tent after we had gone to bed and ran over the face of one of the sleepers. There were several foxes that smelled the meat in the tent and they were bold enough to come in where we slept and try to steal it.

When the hunters left the butchering place, the wolves, coyotes and kit-foxes rushed in to eat the rejected pieces that were left on the ground. The wolves snapped and fought with one another, but I never saw the foxes or coyotes fight. The pack soon cleared up the discarded scraps. Sometimes big red foxes also joined the pack.

*Transporting Meat with Dogs.* All the members of the camp went to the butchering place the next morning to bring in the meat left there



through the night. We took our dogs with us, but everyone expected to help pack the meat back to camp; however, the men carried the heaviest loads.

My husband and I led our dogs to his meat pile and loaded our travois. We did not cover it, neither did we pierce holes through the viscera of the pieces. The meat was simply loaded on the basket and bound with thongs attached to the travois basket for that purpose. I knew by experience how much of a load each of my dogs could drag. I usually tested the weight of the load by raising the travois, holding the poles about half way between the basket and the dragging ends. As they were well fed, the dogs were very quiet and not at all excited when they arrived at the butchering place. However, though they were not at all hungry, as soon as we arrived we gave each dog a small piece of meat. After I had loaded both travois, I made up my own pack which consisted of one buffalo cowskin, the sinew from one side of a buffalo cow with all the meat attached, the ribs of one side with the meat attached, and one buffalo tongue. This was such a heavy load that when I came into camp the rest of the party were astonished. They came up and tried the weight of my pack and said, "This is too heavy for a woman to carry, she should not try to carry so heavy a pack."

We had started with our dogs just after sunrise. We had risen quite early, cooked our breakfast of fresh buffalo meat, boiling some and roasting the rest. We drank the broth from the boiled meat instead of coffee. I remember we boiled our meat in a tin pail and that some had tin cups from which they drank, while others had horn spoons.

We made two trips to the meat pile. As I have said, the first trip I loaded both my dogs with meat and I myself carried home one skin and some meat. The second trip, each dog was loaded with one half a skin and some meat. This half skin was spread on the travois basket, flesh side up, and folded over the meat. I have already remarked that the meat on the travois basket was not covered during the first trip. On the second trip, I also carried home some meat, but no skins. As my husband had killed two cows, both skins have been accounted for. Buffalo cows were commonly skinned by splitting the hide down the middle of the back, if it was intended to use the skin for robes; but if a bull-boat was to be made of the skin, the animal was skinned whole.

Kidneys from freshly killed buffalo were ordinarily eaten raw or roasted on the coals. They were never boiled, but were usually eaten as soon as they were brought in and while still warm, as they soon spoiled; indeed, they could hardly be kept over night. The fresh warm kidneys were especially coveted by sick people.

*How We Traveled with Bull-boats.* We remained in this camp about ten days. The men hunted until they succeeded in killing buffalo; then we took a half day to bring in the meat which the women dried. Between hunting periods, when it was necessary to dry the meat, the women busied themselves in making bull-boats.<sup>1</sup> We had brought with us one bull-boat, but I now made another. Each of these boats had a cowskin cover. When each family was provided with two bull-boats we ceased making them. My husband and I loaded one of our boats with hides and meat while my husband and I paddled the second. In the boat with us were our dogs and some additional bundles. Hereafter, I shall call the first mentioned our freight boat, and the second our passenger boat.

I have said that the freight boat was loaded with hides and dried meat. The hides were tied up, two or three in a bundle, flesh side out. The meat was tied into bundles small enough to be readily lifted. When a buffalo was killed, the paunch was taken out and dried for use as a wrapping when we made up a bundle of dried meat. The dried paunch was laid flat on the ground and the meat placed upon it. I then stamped the dried meat down solid with my feet, standing on the bundle for this purpose. The bundle was then tied snugly with rawhide thongs. Of course, these thongs passed around the dried paunch which was wrapped about the meat bundle.

Other bundles were simply tied with thongs, for naturally, we did not have enough paunch coverings for all of them. To make a paunch wrapping, the whole paunch was taken. Unless meat was very scarce and we had to save as much as possible, the inner coat of the paunch was peeled off and tossed away. The paunch was then cut to dry it. When properly cut, its length and width were approximately the same. The object of cutting the paunch was to make a symmetrical sheet. The walls of the paunch were thicker in some places than in others. In these thick places the paunch was split and the pieces opened and folded back, making the paunch into a bigger sheet when it was spread out. We knew just where to split it to make the largest and most symmetrical sheet. Also, if the thick walls of the paunch were not split it was apt to spoil in drying and become decayed and full of worms.

A buffalo bull, if a fat one, made just four bundles of dried meat; a buffalo cow was smaller. I am not sure just how many bundles the dried meat of an average cow made.

We camped at this place, ten days; the men hunting, the women drying meat and making bull-boats. When we were ready to move

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<sup>1</sup>See pp. 276-277, 285-287, 295.

camp I carried the bull-boats down to the river, one at a time, the new boat first, turned upside down on my head like a big hat. At the river's edge I drove a stout stake into the soft mud and tied one of my boats to it with a thong and the boat floated out on the water. The river bank on



Fig. 84



Fig. 85

Fig. 84. Buffalo-bird-woman and her Husband paddling one Bull-Boat and towing another loaded with Meat and Skins.

Fig. 85. Wading into the River to load a Bull-Boat.

the side nearest the camp, which was about seventy-five yards from the river, was not steep. I packed the bundles I wanted to load into the boat down to the bank on my back, using a two-banded packing strap. First, I carried down the dried hides, each tied singly. I put them into



the new boat, fitting them in snugly. I had five hides in all to load on my boat; I counted two half hides together as one bundle.<sup>1</sup>

Having loaded the hides, I proceeded to add my bundles of dried meat. When the boat was full, I covered all neatly with one of the pieces of old tent skin I carried with me to help cover our improvised tent which the camping party set up at every stopping place. This covering was bound down by thongs passed over the mouth of the boat (Fig. 84). Then I lashed my two travois in the rear of the boat so the baskets would be kept dry on its edge although the ends of the travois dragged in the water (Fig. 84).

When I brought the two boats down to the river, I set my passenger boat on the ground, mouth up, but pushed the freight boat out into the water, tying it with a thong to a stake driven into the bank.

When I had loaded the freight boat, I pushed the second (passenger) boat out on the upstream side and lashed both together securely by passing a thong under a rib inside each boat and drawing it taut, allowing no play to the boats. The tow boats were lashed head to tail, that is, every bull-boat was built so that the head of the skin covering was forward; in this case the second boat was lashed with its head to the tail of the first (Fig. 84). Then I untied the freight boat and let it float until the passenger boat was abreast of the stake, where I anchored it. I recollect that I put some bundles into the second boat, but do not remember now what they were, probably meat or hides. I placed my ax and hoe in the bottom of the boat. While I was loading the boats I had to wade into the soft bed of the river until the water came up to my knees, so I removed my moccasins and leggings and drew my skirt up under my belt to avoid wetting it (Fig. 85).

When both boats had been loaded, I waded out and climbed into the passenger boat, being careful to sit as nearly in the middle as I could. I now called my two dogs, U'x-itic, Short-tail, and Ita-cípihë, Painted-face-black-killed,<sup>2</sup> and they readily sprang into the boat. My husband, who had helped to load the boats, like myself, had taken off his moccasins, but retained his leggings which he had rolled up to his knees. He put his gun in the boat, leaning the barrel against the rim. He untied the boat,

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<sup>1</sup>Buffalo-bird-woman is not very clear here. She has stated in a former paragraph that the dried hides were tied up two or three to a bundle. She here seems to imply that one entire hide made a bundle, and two half hides made one bundle. Neither Buffalo-bird-woman nor Goodbird in translating is careful to distinguish between a whole hide and a half hide. Goodbird usually translates the term by "buffalo skin" unless I am careful to question him. I think Buffalo-bird-woman here means that one whole buffalo hide or two or three half hides made one bundle.—G. L. W.

<sup>2</sup>Buffalo-bird-woman gives the number of her dogs as three and names them differently in the portion of her account related in 1913. It was agreed between us that names of any dogs of her family might be used as she could not always recollect how individuals of the pack were named in a particular year.—G. L. W.

waded in, pushed it out into deeper water, and climbed in. As his weight brought down his side of the boat, I moved toward the opposite edge to balance the boat and prevent it from upsetting (Fig. 84). Fig. 84 will give an idea of how our passenger boat was loaded. My husband and I each had one paddle. I had brought my paddle from the village. It had a hole in the middle to make it more easily managed, for the water passed through the hole so that the paddle did not play from side to side as a solid paddle invariably did. While in camp I had made a second paddle of a piece of drift cottonwood that had floated down the Missouri and was cured. I made a hole in it similar to that in the old paddle. My husband used the newer paddle, since it was larger and heavier than the old one which was better suited to my strength.

I sat at the left of the boat with my feet turned to the right and paddled. An Indian woman always sat in this fashion unless she was left-handed; in that case her feet were turned to the left. When wearied, my husband and I changed places, but even then I sat with my feet to the right. I do not recollect whether my husband sat with his feet to the right, probably he did. We each sat on a bundle of some kind (Fig. 84). We sat a little forward, the dogs and some bundles behind us, and a few bundles in front of us.

When at home at our village, if I had occasion to cross the Missouri in a bull-boat, I knelt in the forward part of the boat because I could deliver a better stroke with the paddle. However, on this journey, there were two of us paddling, one on either side; besides, as we were going downstream a heavy stroke was unnecessary, since we had merely to keep the two boats in the current.

The two paddles were decorated with my husband's honor marks (Fig. 86). Of these, the one on the left was brought from the village; like the newer paddle it was made of cottonwood. The entire design refers to the time when my husband was wounded in his right thigh, the horse he rode being killed with the same shot. The uppermost marks represent the tracks of a man's moccasins with wound marks like flowing blood falling from them. The three lowermost symbols are hoof marks of a horse, also with wound marks. The design means, of course, that my husband had been wounded in the foot or leg and that his horse had been shot. The marks on the second paddle signify "I was in battle and an enemy was killed and I was one of four warriors who counted coup upon him." The spiral design signifies, "I struck one enemy." In this case, the enemy that was struck was not the only one killed in the battle. I made this paddle at the same time I built the second bull-boat. My hus-

band smoothed it down with his knife and added his honor marks by anointing his index finger with buffalo fat, dipping it into his paint bag, and drawing the design in red upon the paddle with his finger. The paddle was always dipped into the water painted side forward. As it was not used against the water the design was retained for a long time. The back of the paddle was unpainted.

Son-of-a-star carried his paint in a paint bag. In olden times the husband carried a paint bag and every morning painted his face, as did his wife and children also. In those good times everybody in the village appeared with faces handsomely painted, though at present we no longer follow this custom and walk about with unpainted faces, looking just like ghosts. In olden times, young men usually provided themselves with a light red and a yellow paint, though older men used only the red paint.

On this hunt, my husband, Son-of-a-star, carried a paint bag for his use and mine; but an unmarried woman carried her own paint bag. He did not, however, trouble to paint his face very often, only painting every now and then. I painted every morning because the wind and air made our faces dark, tanned them as you say, so we painted that our complexions would not darken. If a woman with a very light complexion did not paint her face it became as dark as anybody's. To paint my face I rubbed grease made from buffalo back fat into my palms and then rubbed my palms over my face. Then I opened the mouth of the paint bag and with the flat of my three fingers I touched the paint, principally where it clung lightly to the sides of the skin bag within. Of course, a little of the paint clung to my fingers which were oily with the buffalo fat. I now touched my fingers, first to one cheek and then the other, and finally I rubbed the paint evenly all over my face.

My husband, Son-of-a-star, carried a small bag containing an awl, scissors, and sinew thread and also his paint bag. When he was a young man he carried a small lookingglass in a beaded case with an otterskin handle which he slipped over his left wrist. He used this mirror when he painted his face. The young men were rather particular about their toilet.

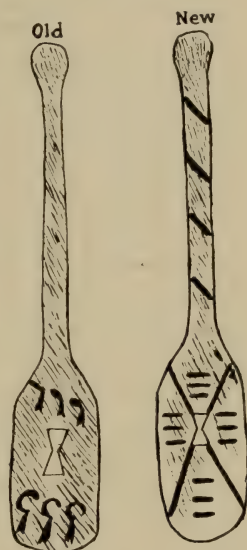


Fig. 86. Bull-Boat Paddles decorated with Honor Marks.



There were eleven bull-boats in our party. Each couple, except I'dutsatsahic, or Scar, and his wife, Tsakákawiac, or Bird-woman had two boats. They had one boat. They were a young couple and thought a good deal more of having a good time than of taking home a big load of dried meat. Scar's wife's name was Tsakákawiac, or Bird-woman. She was my friend and a member of the Prairie Chicken band. Our boats proceeded in no particular order, any couple paddling ahead as they wished.

We had paddled about five miles down the river when we saw a large herd of buffaloes covering the shore on our right. "Let us get off and hunt some more," said the men of the party. We made our way to a small piece of woodland farther downstream where we landed in such a position that the trees hid us from the herd. The men of the party sprang out and held the bull-boats, while the women landed. There was a bar of clean sand about two feet higher than the level of the water, while just beyond rose the bank, probably about ten feet high. We landed on the sandbar, unloaded the boats, and drew them up on the bar. Then we carried the bundles and boats to the higher ground above the bank. Along the edge of the Missouri River are always found dead and dried willow sticks. We gathered some of these, carried them up the bank, and laid a floor of dried sticks on the prairie grass. We laid our bundles on these and turned our bull-boats over them, mouth down. Of course, I do not mean that the dry and dead willows were laid out in one big floor; I mean that each couple gathered these sticks and laid them out close together on the prairie, making a floor big enough to hold their baggage. This was to prevent it from touching the damp soil. The bull-boats were turned over the bundles to protect them from rain and mist. As soon as the boats and baggage were deposited on the upper bank, the men took their guns and stole away after the buffalo. We had landed a little before noon and, as we worked rapidly, the men were ready to start about noon.

The hunters advanced on the herd, sheltering themselves behind any rising ground they could find, while they picked out the fat cows they wanted to kill. Soon we heard the report of their guns; they killed five fat cows. While the hunters were stalking the herd, we remained quietly in camp and kept the dogs from making any outcry; but as soon as we heard the reports of the guns, we gathered sticks for a fire. I think the first of the hunters who returned, struck fire for us with his flint. We had but one fire in camp in the open air, for we had not pitched our tent. The women prepared a meal and after we had eaten, harnessed

the travois to the dogs and went to bring in the meat. My husband and I made two trips, if I remember correctly; some of the people made three trips. We built stages, cut the meat into thin slices, and built fires under the stages to dry the meat.

Before nightfall, we cut broom brushes, or buck brushes, and spread them on the ground for beds. Each couple prepared its own bed, choosing any convenient place not far from the campfire. We cut a great deal of dried grass with our knives and placed a pile of it at one end of each bed for a pillow. For our own bed, my husband and I spread a robe with the fur up and two robes to use as covers, which he laid fur down. These covering robes we laid over us with the head toward our feet and the tail toward our heads. When the men went to bed, they forsook the fire which sometimes went out; but very often we found coals in the ashes the next morning with which we built the fire up again. Although we slept in the open air, we followed our usual custom in disposing of our clothing for the night. The men took off their shirts, leggings, and moccasins, but the women removed only their moccasins and leggings.

*Rescue of Awa-hitsi-kuwac.* After breakfast the next morning I went down to the river with a tin pail for water. As I came to the edge of the higher bank overlooking the river, I saw that big chunks of ice nearly filled it. I was much surprised, for heretofore, the river had been quite free of ice. There was very little wind, but as the current was quite swift, the big ice cakes rubbing and grating together, and the noise of the water made a loud continuous roar. When the Missouri River is running ice all the mid current is filled, but near the banks where there are sandbars, or in the shallow water, there is no ice, since here the water is not deep enough to float the ice. On the side on which we were encamped was a shallow margin of this kind, free of ice. I now saw, out near the edge of the floating ice, two bull-boats, tied together as hunters tie them, with a woman alone in the foremost, paddling hard. She was just inside the edge of the floating masses of ice and was trying desperately to keep away from the threatening chunks. As the margin of the ice-free water was quite narrow, she was not very far from shore. I ran down to the sandbank and as the woman recognized me called out, "My daughter, catch me!" and held out her paddle. I caught it and drew her to the bank; she sprang out, catching her boat by the rim. I seized one boat and she grasped the second with her left hand, while with the right she caught up her bundles of dried meat and threw them out on the sandbar. This second bank, as I have said, was about two feet higher than the water and about six feet wide at this point.

The woman was Awa-hítsi-kuwac, or He-lies-on-a-red-hill. She was James Baker's grandmother and my friend. Awa-hítsi-kuwac was older than I and a married woman; her husband's name was Short-bull; her father was Kakúi-útsic, or Dried-squash.

The other women of our camp now came out and helped us carry my friend's bundles up to camp. This was easily done, for our camp was only about thirty yards away, for we had slept in the open without a tent.

"My husband and I," she said, "were hunting. After we had killed meat and dried it, we loaded these two boats and I went down the river with them while my husband went along the shore with our horses. We appointed a place to camp, but when I arrived there I did not find him."

When I returned to the village I found how all this had happened. Owing to the fact that the river began to run ice, or for some other reason, Awa-hítsi-kuwac was unable to make the speed she expected down the river and her husband arrived at the place appointed for a camp before she did. Short-bull waited for his wife and when she did not appear he thought she had passed him and gone ahead down the river. He went to the second camping place where they had agreed to meet, but again she did not come. Her husband became alarmed and made his way upstream again to search for her. He found the river filled with floating ice. "My wife is drowned," he thought, and went down the river to Like-a-fish-hook village to tell her father.

Kakúi-útsic was very fond of his daughter and when he heard that she was dead he took her basket, put it on his back, and went through the village, weeping and wailing. He wanted to jump into the Missouri River and drown himself, but the people held him back. Kakúi-útsic carried the basket out of memory for his daughter. I do not know what it was that he cried out when he went wailing through the village, but knowing Indian customs, I suspect that what he said was something like this: "Awa-hítsi-kuwac! ikúxpa áwakafwi-hii!" that is, "Awa-hítsi-kuwac, I will never see her again."

Awa-hítsi-kuwac remained with us in camp all that day and the next also. The third morning, the river was free of ice and she loaded her boats and paddled off. The rest of us remained in camp that day, but the next morning we also loaded our bull-boats and started down the river.

We had no serious mishap of any kind. At night we landed and made an open camp, not troubling to put up our tent. We spread dried willows on the ground. Each couple placed their bundles of meat on the willows and covered the pile with a bull-boat turned over it, mouth down.



These sticks were just the small dead willows sometimes with the bark on or sometimes fallen off. Enough of them were gathered to cover the ground well where the dried meat was to be piled for the night.

Twice in my life, as I recollect, I have been with a party that camped at this place where I am now living and which we now call Independence. Both times we unloaded our bundles of dried meat and piled them on the sandy shore near the river, each pile of meat with a bull-boat turned over it. The party climbed up the steep bank and camped for the night on the higher ground where grass grew. The place where we camped is now my son Goodbird's garden. The river, at that time, ran close to the steep bank, but there was a sandy shore with scattered small stones. The steep bank by the river was just as it is now.

As I have said, we floated down the river, but when we came to the place we now call Independence, we found a camp which four Mandan Indians were just forsaking. They were Foolish-head, Little-bull, Wooden-nose, and Enemy's-head. Little-bull's wife, Turtle-woman, the only woman in the camp, was also with him.

Their boats were all loaded, ready to embark. When we passed, they pushed out into the current and soon caught up with us. They told us they had seen Awa-hítsi-kuwac go by in her boat. The united party floated down the river until we reached a point about two miles below what is now Elbowoods. Here we found the current of the river was scarcely running and the water backing up the shore. When we rounded the point, we saw where the trouble lay. The ice floating down the river had jammed and had bridged the river from side to side, making a kind of dam. We heard the report of a gun and a voice called to us from the north shore. Two white men stood on the bank, waving handkerchiefs. We paddled across the river and landed where they stood. We found two white men, one of them named Spots, who had married an Arikara woman. The Indians called him Spots because his face was freckled. The second white man had married a Blackfoot woman named Flat-nose. These two white men each had a flat boat loaded with buffalo robes and dried skins. With the two white men was Awa-hítsi-kuwac or He-lies-on-a-red-hill.

*Arrival at the Village.* We landed here some time after noon. This place was about fifteen miles from Like-a-fish-hook village. While the rest of our party waited, one of our men went down to the village and notified our relatives, who returned with horses and pack saddles to transport our meat to the village. These pack saddles were made with horn frames. It took four horses to pack the baggage of myself and

husband to the village and about the same number for the baggage of each of the other couples of our original party. Our dogs transported the bull-boats on travois. The horses from the village reached us about noon the next day. The whole party arrived at Like-a-fish-hook village just at sunset. Awa-hítsi-kuwac reached the village safely to the great joy of her father.

## A TRIBAL HUNT TO THE YELLOWSTONE IN AUTUMN.

Having presented a narrative illustrating dog culture, we may complete the picture by describing a hunting party using both horses and dogs. They set out in the autumn and the route was from the Hidatsa village to the Yellowstone River. It is inevitable that since both horses and dogs were used on the journey, some additional information is given concerning the handling of dogs and horses and there may be some duplication. Nevertheless, we have thought it best to give the whole narrative, as it appears to be the only narrative account of a tribal migration during the transition period from dog to horse culture.

The informant is again Buffalo-bird-woman, speaking in August, 1913. The time of the hunt was about the year 1869.

*Choosing a Leader.* The people at Like-a-fish-hook village had seen no buffalo herds for seven years, when word was brought to them that there were buffalo far up on the Missouri. "We will go and seek them," the hunters said. All the village, Hidatsa and Mandan, prepared for the hunt.

First, it was necessary to choose a leader; but this was not always easy, since our people expected that no misfortune would befall them while on the hunt. They did not wish anyone to die and wanted to obtain plenty of buffalo meat and be lucky in everything they undertook. If misfortune befell them, the leader would be blamed, of course.

The men of the Black Mouth Society,<sup>1</sup> collected a quantity of goods from the people and with this for payment, sought to hire a leader. They went from lodge to lodge in a body, four of their number carrying the great bundle of calicoes, blankets, war-bonnet, guns, and other gifts. They offered these gifts successively to several owners of medicine bundles, men whose prayers were known to be strong. One after another, they refused the leadership.

The Black Mouths came at last to Edi-ákatac, or Belly-up, and said to him, "We want you to be our leader." "I will be your leader," he answered, "but I want you to choose another to act with me." So the Black Mouths gave half the gifts to Small-horn, saying, "We want you to be leader also, for we wish to have two leaders for this hunt." Both men were Hidatsa. This is the only time I ever knew two leaders to be chosen for the same hunt. They led on alternate days.

It was the duty of the leaders to notify the people of the time for departure. Red-kettle, acting as herald, went through the village, cry-

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<sup>1</sup>See this series, vol. 11, 274-280.



ing, "Five days hence, we will set out on a hunt. Everybody get ready." This early notification gave the people plenty of time to bury their valuables in the cache pits. The evening before the start, Red-kettle, again went through the village, crying, "Tomorrow we move," and again in the morning, he went around, calling, "Take the tents down."

The two leaders paid the crier, I think, from the gifts that had been given them. I remember, once when my father was leader, he appointed Has-a-game-stick as crier, and paid him.

Goodbird adds:—

My father, Son-of-a-star, was once leader. He chose Belly-up as crier and paid him for his services.

Butterfly adds:—

I was on that journey. I was twenty-one years old then. I am now sixty-six.

*Vehicles.* We went forward in a long line over the prairie. The leader for the day went ahead and whoever was ready followed immediately after him, some on foot and some on horseback, while a few rode on horse travois.<sup>1</sup> Only a few of our horses had travois as I do not think this method of transportation was as popular among the Hidatsa as among other tribes from whom we learned its use. However, we had a good many horses; no family was without them. Some men had two, some three, and some as many as twenty. Big-cloud and Garter-snake-coat each had about eighty, I think. A man and a woman did not ride the same horse, though very often two children rode in that fashion, especially for a short distance. Saddle bags filled with baggage were carried by many of the horses while a man or a woman rode in the saddle. A medicine bundle might be carried in front of the saddle bound to the head. There were only two wagons in the village; they were owned by Black-hawk and Raise-heart, and were each drawn by two horses.

*Order of March.* We followed a single trail, sometimes two men or two women walked side by side, talking; sometimes they walked in single file. No one was allowed to precede the leader. If anyone in line stopped for any reason, to make repairs in his saddle, for instance, the

<sup>1</sup>Brackenridge, *ibid.*, 177, writes of the Mandan:—

They sometimes go out on hunting parties by whole villages, as was the case at present. They appeared to be about 500 in number, some on horseback, the greater part on foot. A numerous train of dogs were employed in dragging their baggage, tent poles, etc.

The following extracts from Boller (*ibid.*) are also of interest in this connection.

"... We quickly fell in with the grand cavalcade of warriors, mounted and on foot; horses drawing loaded *travées*, upon which were sometimes tied two or three children, and as many puppies, clinging together with the most ludicrous tenacity.

Dogs also dragged their full share upon miniature *travées*, occasionally joining in a grand skirmish with their unemployed companions, usually resulting in the complete rout of the latter." (177.)

"Indian dogs, like their wolfish progenitors, are exceedingly cowardly, all bark and none bite; but the moment one is harnessed to his *travée*, conscious of the protection it affords him, he becomes very quarrelsome, and when a number get together they make 'the hair fly' to some purpose." (177-178.)

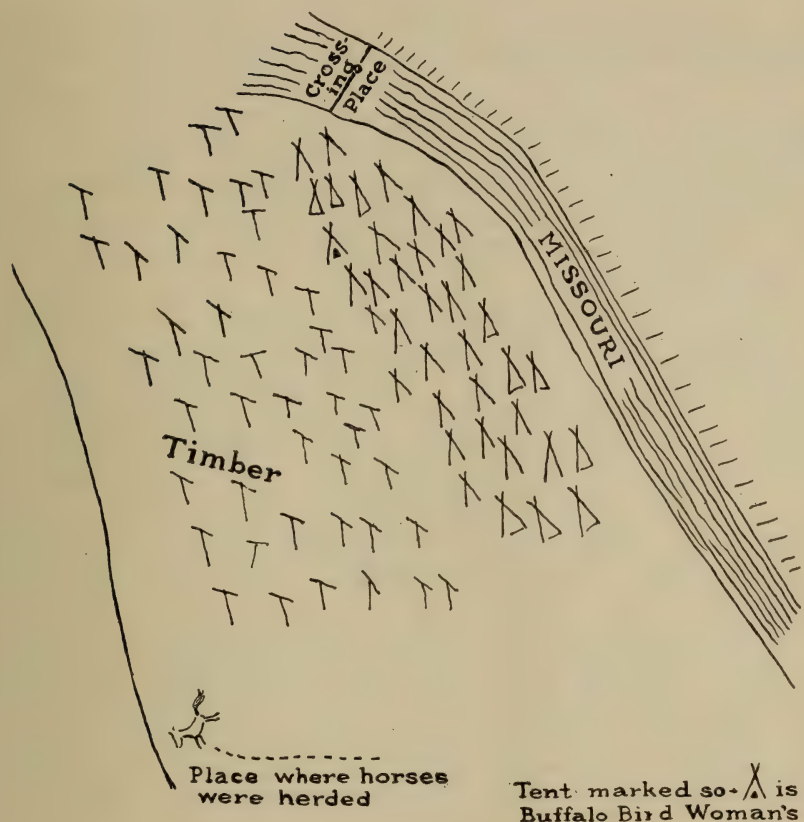


Fig. 87. Sketch Map of Camp on a Sandbar where Goodbird was born.

line passed around him and when ready he joined again, falling in at any convenient place. Families stayed together on the march. The younger men went ahead, scattering in the hills and in the timber to hunt deer and antelope, returning in the evening with any meat they had procured.

Goodbird adds:—

In the winter, in deep snows, hunters walked in single file and took turns in breaking a trail through the snow. Of course, we did not do this during this hunt as it did not take place in the winter.

Our first camp was near a lake about six miles from Like-a-fish-hook village. (I can only name the camps, but my son, Goodbird, can give you the distances in miles, fairly accurately.) Then we camped at a place called Narrow Hill, two miles up the river from Like-a-fish-hook Village.

We obtained our water from a creek about a mile north and also from a spring called Maháakúxabuác, or Noisy Spring, about a mile west of the camp. Our third camp was at a place called Good Point, thirty-five miles up the river from Fort Berthold, or Like-a-fish-hook Village. Our next five camps were at Shell Creek, eight miles from Good Point; at upper Knife River, fifteen miles from Shell Creek; at Crow Paunch Pit on the Banks of the Missouri; at Flint Steel Creek; and at Yellow Water Pond which was a particularly good camping place. Here we drank of the pond water.

Our next camp after this was near the mouth of the Yellowstone outside of Fort Buford, toward the river, where there were a great many soldiers. The soldiers came down to look at our camp and seemed to be very good people. Many of them gave coins to the children, five and ten cent pieces. We bought some flour here; before this, at other camps, we had eaten deer and antelope meat and corn. We camped here three nights. Then we moved five miles up the Missouri and camped again for three nights. We then moved two miles down the Missouri where we found a sandbar at a narrow place in the river where there was a good crossing.

*Our Camp on the Sandbar.* About noon, we camped on the sandbar. There were about one hundred buffalo skin tipis in the camp. When we camped in a good level place it was customary to pitch the tipis in a big circle, and if the wind was calm when we pitched camp all the tipi doors faced the center of the circle. However, if we were camped along a creek that had a narrow bank, or in any other place where a circle could not be easily formed, the tipis were set up in rows or whatever other arrangement the formation of the land compelled. If there was a stiff wind blowing a tipi was pitched with the door away from the wind.

A rude map of our camp on the sandbar is shown in Fig. 87. Because of the shape and narrowness of the sandbar it was impossible to have a camp circle so that our tipis stood as shown in the map.

Our horses were herded half a mile away on the other side of a stretch of timber that skirted the sandbar. During the day, the horses were guarded, but at night, they were hobbled and left to themselves. When the time came for a family to cross the river, their horses were brought in from the herd.

*Turning a Tipi.* Camped thus in a tipi, if a windstorm arose and it became necessary to turn the tipi with the door away from the wind, my husband and I and two or three neighbors, who were invited to help us, could very easily turn it around. Sometimes five persons' and sometimes



seven or more turned the tipi; the larger number could handle it better, though if there were people enough to hold the foundation poles steadily that was sufficient.

First, the pins that held the cover to the ground on the outside were pulled up. Then, we went inside the tipi, picked up the four foundation poles and the one to which the cover was tied and moved the poles and

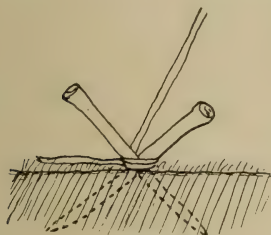


Fig. 88

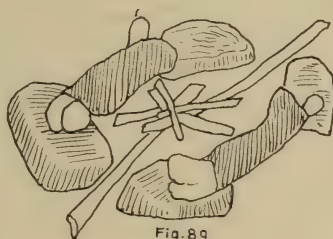


Fig. 89



Fig. 90

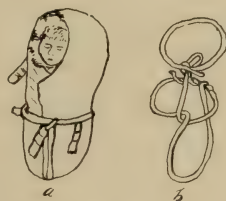


Fig. 91

Fig. 88. Method of Driving Stakes into the Ground to hold the Anchor Rope of a Tipi.

Fig. 89. Roasting Buffalo Thigh Bones before the Tipi Fire.

Fig. 90. Making Fire with a Wooden Drill.

Fig. 91. *a*, Goodbird's Wrapping, as a Baby, on the March; *b*, The Tie for the Thong binding the Baby Bundle.

the cover at the same time. The rest of the poles were now shifted about as was necessary. If the five poles were held firmly while they were moved about there was no danger that the tipi would fall down.

A Mandan tipi could be raised and turned by four persons since its foundation was of but three poles.

*Anchoring the Tipi.* During a windstorm it was often necessary to anchor the tipi to prevent it from being blown over. For this purpose a

rawhide lariat was passed around the poles, inside and under the tipi cover, and the ends were drawn together in a noose. The noose was pushed up by means of a forked stick to the point where the poles converged, and drawn taut. Then the loose end of the lariat was drawn downward and tied to a pin driven into the ground, four or five feet from the fireplace, toward the windward side of the tent. Very often two pins were driven into the ground and crossed as in Fig. 88. If the tipi were very large, it might be anchored with a second lariat on the outside.

In a Mandan tipi, a lariat always hung in the center in readiness for a storm. The Mandan three-pole tie was weaker than our Hidatsa four-pole tie and for that reason a lariat was passed around all the poles at the tie. In the Hidatsa tipis this was unnecessary, except in a heavy wind-storm, since our poles locked at the top.

*The Fireplace.* Our fireplace was in the center of the tipi on the level ground. Five or six stones were placed around the fire; upon these we roasted meat. We never used white stones, for they cracked with the heat. The stones were placed far enough apart so we could roast the thigh bone of a buffalo before the fire (Fig. 89). We cut the tough outer flesh from the thigh, leaving the more tender flesh still clinging to the bone, and this was laid near the fire, the two ends resting on two stones. When the meat was roasted and had been cut off, the bone was cracked open and the marrow pried out with a chokecherry stick and eaten with the meat.

We also roasted a cow udder on a stone before the fire, turning it over to roast it on both sides. We thought a roasted udder full of milk a great delicacy.

In my time, we carried metal kettles with us. I do not know whether our old-fashioned pottery vessels were ever taken on a journey; they were never so taken in my lifetime.

*The Fire.* The fireplace was surrounded by stones only when wood was scarce and buffalo chips were used for fuel, but when it was abundant the kettle was set directly on the coals and the meat roasted on wooden spits. When we camped on the prairie, however, we could obtain no wood, and made our fire of buffalo chips. In that case, we roasted our meat on stones (p. 235).

On this trip we used matches to start a fire, but on other trips my father, Small-ankle, started fire with flint and steel. He carried his fire-making implements at his belt over his right hip. These consisted of a sharp flint two and one-half inches in diameter and a semicircle made from an old steel file which was slipped like a ring over the fingers of the

right hand. He held the flint in his left hand and under it laid a little piece of dried puff ball that had been moistened slightly and rubbed on the surface with gunpowder. A spark struck off by the steel set fire to the puff ball. Sometimes he used very soft rotten wood instead of a puff ball.

In very old times, the Hidatsa produced fire with a wooden drill. Though I have never seen this done, I know from the old stories that the drill was held in the two palms and twirled back and forth. In Fig. 90 Goodbird has made a sketch of how I think this must have been done. I have heard they used cottonwood for the base and I think the drill must have been of hard wood, but I do not know certainly.

When the puff ball had caught fire it was placed in a little bunch of shredded dry grass which was then waved back and forth in the air to fan the flame. As I remember, Small-ankle did not strike the spark upon one whole puff ball, but carried in his fire bag a number of these powder-prepared bits of puff ball.

In our lodges in Like-a-fish-hook village, the fire was smothered at night. If it became extinguished by any accident, the woman went to a neighbor who had a fire and got some coals. We followed the same custom when in camp.

*Use of the Heart Skin.* When on a journey, we always carried a buffalo heart skin with us for fetching water. For use, the heart skin was turned wrong side out, exposing to the weather the smooth surface next to the heart. There was still another use for the heart skin. Unused roasted meat to be eaten as lunch on the road or meat that was to be carried to the next camp was very often carried in it (p. 159). The heart skin was a recognized lunch bag.

*Goodbird's Birth.* It was in November, as nearly as I can remember, that we made our camp on the sandbar.<sup>1</sup> We did not know the months of the year as accurately as white men do, but I remember that the moon was in the last quarter. I am not sure that when we say last quarter we mean just what the white people mean. What I mean is that the moon was a thin half circle shaped like a bow. We have three terms to express the waxing and waning of the moon: *midi-kakixits*, or "moon round," meaning a full moon; *midi-kidě'hits*, or "moon gets up," that is, raises itself or resurrects itself; and *midi-tehits*, or "moon dead."

It was known to everyone in the tipi that I was to give birth to a child; so everyone, but me, my father, Small-ankle, and Strikes-many-

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<sup>1</sup>According to the belief of the informant this was seven years before the Custer battle, or about 1869.



women went away from the tipi. My husband, Son-of-a-star, went to stay with his brother, Red-stone. My child was born a little before sunrise.

Son-of-a-star was in a tent nearby and heard the cry of the child. Later he told me, "I was very happy when I heard the cry of my babe." A piece of an old robe cut out for the purpose was put down on the floor and over it a cloth was laid; the baby was laid on top of this and bound up. On the outside, a soft calfskin was wrapped around him, or sometimes a wildcat skin, but this was done only on the march when there was danger that he would be chilled by the wind. Two wildcat skins and one calfskin were kept for the baby's use, to serve him as a robe does, for an outer dress. The calfskin and wildcat skin were arranged like a hood over the child's head and turned fur side in. A wildcat skin has soft warm fur and was a good wrapping to keep a child warm. Fig. 91a is a sketch of Goodbird's wrapping on the march. It will be noted that the wildcat skin is folded over his head like a hood. He is tied with only a single band. Fig. 91b shows the tie for the thong that bound the cradle bundle. After the fourth day, the cradle bundle<sup>1</sup> was bound with three ties.<sup>2</sup>

*Corn Mortars.* Some of the members of our hunting party brought with them the heavy wooden mortars and pestles they used when in the village. The majority of the families, however, contented themselves with carrying with them only the pestle and constructed a mortar of buffalo skin, cut square, as in Fig. 92a. The skin for this mortar was taken from the dried hip skin of a buffalo bull and pounded with an ax to remove the hair (Fig. 94). A saddle blanket, or saddle skin, was spread on the ground, and the skin laid on it, fur side up. Then the whole surface was pounded with a scraping motion and the hair removed. Later, it was rubbed with a stone to remove any stumps of hair remaining on the skin. This de-hairing process is still in use on this reservation. The skin square was then folded over and the lower corners trimmed as in Fig. 92b. Then it was sewed together at the edges to make the form shown in Fig. 92c. A hole was dug in the ground and in this the skin mortar was snugly fitted. In Fig. 92c, the mortar is shown in use; it will be noted that the pestle was used in the same way as in the wooden mortar. This type of skin mortar was used to pound parched corn and dried meat,

<sup>1</sup>By cradle bundle, I mean the wrappings of a babe under a year old. The wooden cradle used by so many tribes, seems to have fallen into disuse among the Hidatsa, if indeed it ever was in common use by them. Such at least is Buffalo-bird-woman's opinion.—G. L. W.

<sup>2</sup>Buffalo-bird-woman's explanation here seems a little obscure. The drawing which Goodbird made and which was approved by her, is shown in Fig. 91a. There seems to be but one tie, instead of two, as shown in Fig. 91b. Whether this is an error, or whether Fig. 91b is counted as a three-tie binding such as was used after the fourth day, does not seem plain. I am inclined to think that the cradle bundle, Fig. 91a, should receive the two-tie thong shown in Fig. 91b, and that Goodbird in the former figure has either erred or else has not completed the tie because the smallness of the figure made it difficult to draw.—G. L. W.

especially meat that was partly toasted and dried over a fire. Such dried meat was pounded and mixed with bone grease for the old people whose teeth were well worn.

As I have said, the pestle was brought from Like-a-fish-hook Village. It was carried on a dog travois, resting with the smaller end forward and bound to the travois cushion while the larger end rested on the travois basket (Fig. 93).

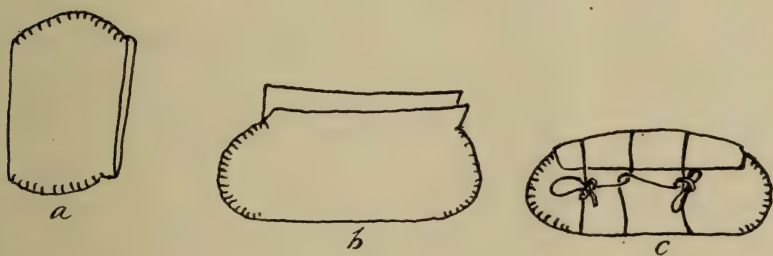
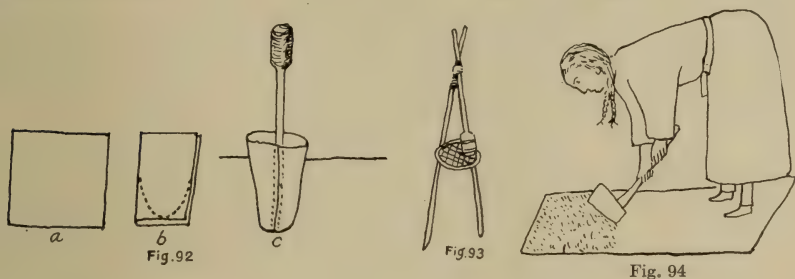


Fig. 95

Fig. 92. Construction of a Buffalo Skin Corn Mortar.

Fig. 93. How a Pestle was carried on a Dog Travois.

Fig. 94. Removing the Hair from a Buffalo Hide to make a Corn Mortar.

Fig. 95. Construction and Tie for a Buffalo Skin Bag.

*Crossing the River.* The morning after the birth of my son, the people began to cross the Missouri River. I do not know who went first, though I do not think it was necessarily the leader. In all probability it was some family whose boat was ready who led the way merely because they were the first to complete their preparations. I do not remember whether there was more than one boat in the river at a time, or not, though probably there was.

Our family crossed in Small-ankle's bull-boat which we had brought with us. My husband, Son-of-a-star, helped me in crossing, paddling, while I sat in the boat and held my baby. Usually, the women paddled

the bull-boat. Our tent poles, tied in a bundle, were fastened to one of the ribs of the boat, and floated behind. In addition, a horse travois and a dog travois were floated over in the same way.

Our horses were made to swim over. One of them was led by a halter, or bridle, made of a lariat, and our other horses followed of their own accord. In each bunch of horses, there was usually a leader, very often an old mare; it was the leader of the herd that was bridled while swimming over, and the rest followed.

We camped on the bank on the other side, which we found quite steep, much like the bank of the Missouri River at Independence. For a hasty meal, we parched corn and pounded it in a skin mortar.

We camped here three days, awaiting the crossing of the rest of the people. Our next camp was at Gun-hanging Hill where a son was born to an Hidatsa woman named Buffalo-woman. She named her child Many-birds. The next day we entered the Bad Lands. At our camp in the Bad Lands White-cherry gave birth to a babe. Our next camp after we left the Bad Lands was at Three-peak hill.

*Pack Animals and Their Loads.* On this trip our family had, for pack animals, two horses, two mules, and three dogs. Both horses were ponies, since big<sup>1</sup> horses were very scarce in the tribe at this time. Mules were also scarce and were valued because of their strength. The two mules and three dogs each dragged a travois; one of the ponies dragged six, and the other, eight tent poles, but no travois. Before I describe these seven animals and their packs, I will explain the construction of the bags we used for transporting our possessions. Skins that were to be made into bags had to be prepared carefully. A tent skin was of no value for a packing bag.

The first type of bag was of unsmoked buffalo skin with the hair removed, dressed and oiled with buffalo brains and liver (Fig. 95). Fig. 95a presents the folded skin, ready for sewing; Fig. 95b, the completed bag with the two flaps for the mouth; Fig. 95c is the sack, filled and tied. In folding the two flaps at the mouth of this bag, both were turned over to one side and one flap was not turned into the inside of the bag. The bag was tied with a thong in three ties. It was about 2½ feet long and about 15 inches in diameter. For this journey we filled it with ripe corn on the ear and dried squash. We did not use this type of bag for shelled corn. We believe that this form is peculiar to the Indians of this Reservation.

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<sup>1</sup>By "big" horses Buffalo-bird-woman means American horses as distinguished from the small Indian pony.



The second form of bag is the one used for shelled corn (Fig. 96). These were made in pairs like saddle bags and were united by a band in the middle about fifteen inches long. Each of the two bags was about fifteen inches wide at the bottom and tapered somewhat to the top. In Fig. 96A is shown the folded skin; the bag roughly cut and sewed is seen in Fig. 96B while Fig. 96C presents the completed bag. For a short journey, the bags were filled and tied at the mouth (Fig. 96D); but if this type of bag was to be carried on a long journey, the mouths of the two bags were sewed. They held shelled corn and were thrown over the horse's saddle like saddle bags.

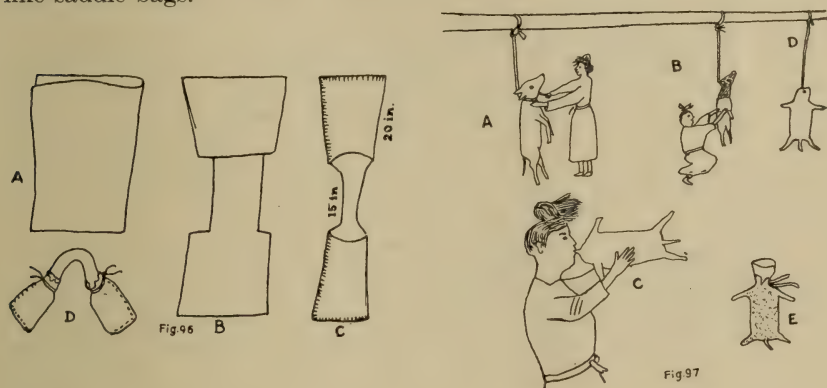


Fig. 96. Construction of a Double Bag used for Shelled Corn.

Fig. 97. Making a Buffalo Calfskin Bag; A, B, skinning; C, inflating; D, drying; E, the completed bag.

The third form was a calfskin sack. The following description applies to the one we carried with us on this hunt.

About midwinter, or the February before we set out on this hunt, Small-ankle brought in a calf whose hair had just begun to grow. Strikes-many-women hung the calf to the drying pole by the neck. With a knife she made an incision quite around the neck just behind the ears and drew the skin backwards and downward, working with her knife and fingers. It was always hard to pull the skin over the shoulders of the carcass without cutting it; but this done, the rest of the work was easy. The leg skins were encircled with a knife just above the hoofs and taken off whole (Figs. 97A and B). Then the four legs were sewed up with sinew thread. The vent was skewered with a small stick woven in and out of the lips, and bound shut with sinew passed just under the stick as in the case of the vent in a bull-boat skin (p. 285). The tail was skinned entire, without

breaking or cutting it; the neck too was sewed up, excepting a very small aperture left to blow in. The skin thus sewed was green and turned with the fur inside.

Strikes-many-women took the skin and blowing through the little hole she had left in it, filled it with air (Fig. 97*c*). Then she caught the lips of the aperture between her thumb and finger, and holding them tight, sewed them up with sinew. To one of the ends of the sewing sinew used to close the neck, she bound the end of a rawhide lariat and hung the skin on the drying pole of the earth-lodge (Fig. 97*d*). When the skin had dried, it was taken down, and the sinew threads of the neck seam cut. The air was expelled and the skin worked with the hands to soften it. Finally, since a buffalo calf neck is quite narrow, it was split down one side level with the shoulder and a mouth of old tent skin, shaped somewhat like a funnel, sewed into it. Then a buckskin thong was sewed on one side of the neck to be used in tying it. Strikes-many-women was very skilful at making bags like these. I can remember six of these bags that she made.

When the skin was softened and ready to receive the corn, it was turned fur side out again. It will be noted that the mouth of the bag shown in Fig. 97*e* was sewed into the bag after it was turned fur out.

*The First Mule.* All our mules were called A'p-i'tía or Big-ears. The two mules we took with us on the tribal hunt were called, A'p-i'tía akú-mikác, mule of lower or less stature; and A'p-i'-tia aku-i'tíac, or Big-mule. The smaller of the two mules was loaded as follows:—

The first morning we saddled the mule. Over the saddle, we threw a double bag filled with shelled ripe soft white corn (atáki, soft). The bag was similar to the one described in Fig. 96. On each side of the saddle was a parfleche filled with strings of dried squash and soft white corn on the ear. Parfleche bags were the shape of an envelope, eighteen inches wide and thirty inches long. It took one whole side of a buffalo cowhide to make a parfleche. Topping the mule's load, was a calfskin sack, like that described in Fig. 97, filled with dried half-boiled green corn, of the soft white variety. Over this was laid a tanned buffalo bull skin folded into a rectangle, hair side in, to prevent the travois thong from wearing out the calfskin bag. This robe was also used during the night for a sleeping robe. All these packs were bound down upon the back of the mule and made taut. Finally, the travois, its thong lying across the bull skin robe, was flung over the saddle. The travois itself had tied to it a hoe and an ax (Fig. 98) with a bull-boat bound mouth down over them. The blades of the hoe and the ax were thrust into a sack like that

shown in Fig. 95 and the bundle was lashed at the head end to the upper rim of the travois basket. No lashing was attached to the handle of either the ax or hoe. Sometimes these tools were lashed to the basket without thrusting the blades into a sack, in which case they were bound on so that the sharp edges of the blades hung over the upper rim, toward the ground.

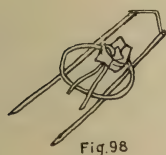


Fig. 98

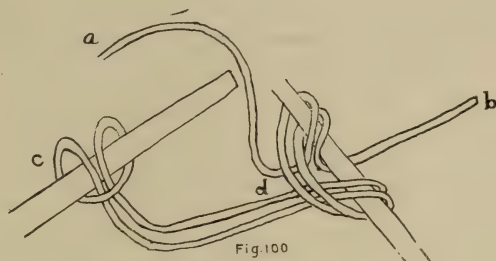


Fig. 100

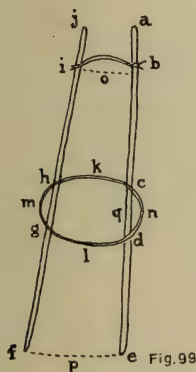


Fig. 99

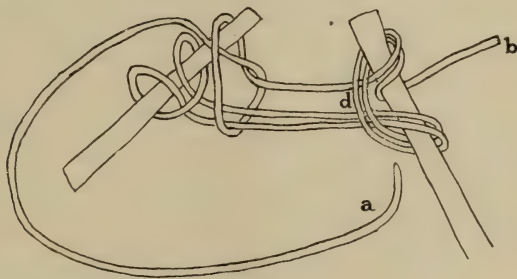


Fig. 101

Fig. 98. Travois with Bull-Boat, Hoe, and Ax tied to It. (The bull-boat and travois basket lacings are not drawn.)

Fig. 99. Diagram of Horse Travois. The following measurements were carefully worked out by Buffalo-bird-woman and apply to the lettered parts as designated: a-b, 8 inches; b-i, 22 inches; o-k, 5 feet 3 inches; a-e, 13 feet 3 inches; e-f, 4 feet 3 inches; l-p, 4 feet 6 inches; a-c, 6 feet 6 inches; c-d, 1 foot 17 inches; d-e, 5 feet 5 inches; n-q, 4 inches; k-l, 2 feet 9 inches; m-n, 3 feet 10 inches.

Fig. 100. Travois Thong Tie.

Fig. 101. Travois Thong Tie as made when Speed was desired.

*The Travois.* In Fig. 99 is shown a diagram of a horse travois. Though the description applies specifically to travois used on mules, the size of every horse travois was about the same. The measurements will be given in English denominations, for I will lay these two long poles on the floor and coil this piece of rope around in the size and shape of the travois basket and from these you may take the measurements. If



you read the inches right, as I help you with this yard stick, I am sure there can be no mistake.

The travois frame was of ash. The ends of the basket hoop were always lashed together so as to place the joint at *k* or *l*, as in the diagram (Fig. 99) but never at *m* or *n*. The ash pole for the hoop should be twelve feet long, allowing one and one half feet to make the joint nine inches long. Of course, since the two ends of the hoop overlapped to make the joint the latter would be just one half the extra eighteen inches allowed. The basket was bound to the travois poles at *c*, *d*, *g*, and *h* (Fig. 99). About eight inches from the smaller end of the travois poles was a groove to receive the thong by which the travois was slung over the saddle. The travois thong tie is shown in Figs. 100 and 101. The nooses, Fig. 100*c*, *d* are each slipped into the groove on the travois pole. These grooves are not marked in the figure. The end, Fig. 100*a*, is now carried back to the left pole around *if* and the noose (Fig. 100*c*) with a simple knot as shown in Fig. 101. If speed is required, the end, Fig. 101*a*, is carried under the horse's belly and tied to the right hand pole just under the right hand noose (Figs. 100*d*, 101*d*). The end (Figs. 100*b* and 101*b*), is allowed to hang free.

If a long journey is contemplated, the end (Fig. 100*a* and 101*a*) is first knotted to the binding cord of the left side of the pack, if one is carried, and then passed under the horse's belly and tied, as before, to the right hand travois pole, while the end (Figs. 100*b* and 101*b*) is knotted to the cord on the right side of the pack.

*The Bull-Boat.* Over the travois carried by this mule was lashed a bull-boat made fast by thongs that passed around the boat and bound it down in four places on the travois poles (Fig. 102). Each of these thongs also passed under the rim of the boat and under one of its ribs and was then tied to the travois pole. This further secured the boat and made it fast. In lashing a bull-boat to a travois it was customary to turn the travois upside down, lash the boat at the corners, and reverse. The paddle was bound on at the top as shown in Fig. 102.

When I made a cowskin bull-boat, I measured the upper hoop from my eyebrows to the ground. The bull-boat I am describing had an almost perfectly round frame, but I remember the old time frame had a slightly more acute angle in front (Fig. 103).

The mule whose load I have described was either driven or led. If the road was good, the animal was driven, but if we were passing through a coulée, on the side of a hill, or through timber, the mule was led. He was a castrated male, as was also the other one we took with us. I never knew a mule to give birth to a colt.

We bought this mule from the Sioux. One of the Sioux said, "Any-one who gives me a horse and some corn may have this mule. I do not care what kind of a horse it is, if I get some corn with it." I heard what this Dakota said and I and my husband went to see him, for he was then visiting our village. We gave them a pony, a gelding that was lazy, and four strings of soft white corn, one half bushel of boiled green corn, and about fifteen pounds of beans. I wanted this mule because one can pack so much more on a mule than on a pony. This mule was my own property.

*The Second Mule.* The larger mule that we called Big-mule was a dark bay, a gelding, like the smaller mule in color. It belonged to Strikes-many-women, though at first Red-white-buffalo owned it. He gave it to

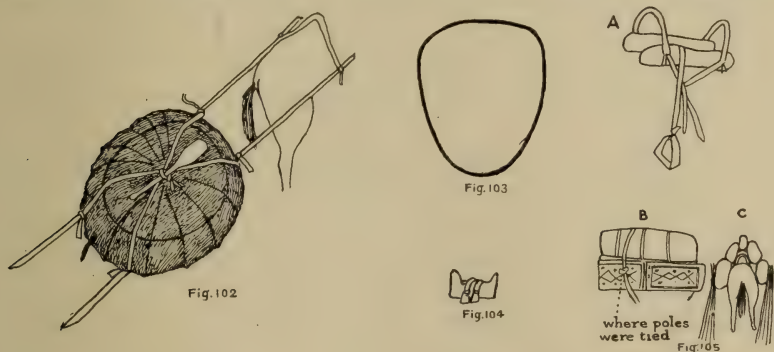


Fig. 102. Method of lashing Bull-Boat to a Horse Travois.

Fig. 103. Form of Old Type of Bull-Boat.

Fig. 104. A Saddle with Two Double Bags filled with Provisions hung on It.

Fig. 105. Arrangement of Bags and Tent Poles for Transportation.

his daughter, Otter or Midapókěc, Wolf-chief's wife, who in turn gave it to Strikes-many-women. Otter loaded the mule. She put on her saddle, then two double bags (Fig. 96), one filled with sugar and one with coffee (Fig. 104). On either side she placed a bag similar to that shown in Fig. 95. The bags, sugar, and coffee she brought from her parents. All these were lashed down upon the animal in the usual way. Over the whole was placed a travois on which was a bag similar to Fig. 95 which probably contained skins for moccasins, sewing thread, etc., two pillows, three half hide robes, and one half skin. These were all folded and tied to the basket hoop with a lariat drawn back and forth over the back. The pillows were all of cloth, stuffed with antelope hair or geese, duck, or prairie-chicken feathers. We never used eagle feathers for stuffing pillows as these birds were sacred.

*The Ponies.* We took two ponies for pack animals, one carried eight and one ten<sup>1</sup> tent poles.

*The Eight-Pole Pony, Lashing Tent Poles.* On either side of the saddle (Fig. 105A) this pony carried one parfleche and one skin bag similar to the one shown in Fig. 95. Fig. 105C gives a rear view of the bags, while a fifth bag which was very commonly placed in this position is shown on top. The round appearance of the lower sack (Fig. 105C) is due to the fact that it was full. A parfleche was considered better for the lower part of the pack as it was smooth and did not stay on the top of the animal's back very well. The lower package was called *itaki it-ä'kidätsë*, pack on side. The upper package on either side was called *itaki itakakà* (pack on top). In loading a pony as this one was loaded, the upper packages were often omitted and the pony ridden by some old man or old woman too feeble to walk, or by one or two small children. In that case, a robe was thrown over the parfleche and the saddle to give a comfortable seat to the rider. A woman rode in the same fashion as a man.

In Fig. 105C will be noted the poles dragged by the pony, as one half of them are lashed on either side of his back. The Assiniboin and the Sioux lashed their poles to the pony's back in a manner different from our method. Some tribes even crossed the poles over the pony's back. The Hidatsa invariably tied their poles as shown in Fig. 105C. Holes were pierced in the smaller ends of the poles, a thong drawn through, and the ends of the thong tied together, thus binding the poles in a loose ring. The poles were then lashed on either side of the pony, as I have described (p. 193).

The name of this pony was *Xaxi-tsi-ac*, or Gray-mottled. He was a gelding.

*Tying up a Tipi Cover.* The pony carrying the six poles also carried the tent skin. When the tent was struck, the cover was untied from the rear pole and laid on the ground, weather side up (Fig. 106A). Then it was folded over once, weather side in (Fig. 106B) and the smoke hole end was folded once over (Fig. 106C). Each end of the package was successively folded over twice (Fig. 106D); the result is shown in Fig. 106E). Now the two sides, *a* and *b*, are folded together and each end is folded twice toward the center (Fig. 107F). A lariat is then passed around three times and tied (Fig. 107G) and the tent swung to the horse's back. Then the free end of the lariat (Fig. 107G, E) was carried under the horse's

<sup>1</sup>Probably an error in translating. She speaks later of six poles being carried by the second pony.—G. L. W.



belly and tied on the horse as shown in Fig. 108A. As has already been said, each of the tent poles had a hole at the smaller end through which a thong was drawn. The larger ends of the poles dragged loosely on the ground, spread fan shape. Sometimes one of these tent poles broke where it was pierced for drawing through the thong. In that case, a slight groove was cut into the pole as a substitute. This, of course, was done only in an emergency, the ordinary method was to perforate the end of the tent pole.

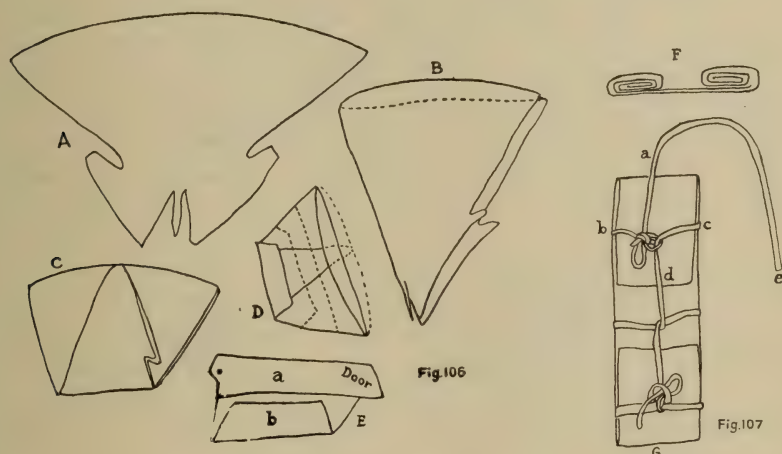


Fig. 106. Method of Folding a Tent Cover in Preparation for Loading.

Fig. 107. A Tent Cover tied ready for Loading.

As the tent cover lay on the horse, it made a load on either side of the animal, twelve inches thick, twenty-six inches long, and twenty-four inches wide, while the connecting portion that passed over the saddle was about eighteen inches long. The tie for the upper part of the package, Fig. 107G, is shown in larger outline in Fig. 108B.

When a pony carried a tent cover, no boy or older person ever rode it.

This pony's name was Pě'pě's, meaning shaggy. She was a gray mare with a shaggy coat.

*Other Horses, Saddle, Stirrup, and Method of Riding.* Besides the two mules, and two ponies, we had four additional horses with us. I rode a black pony named *Cipicac*, or Blackie, a speedy horse that carried a flat saddle stuffed with antelope hair. The stirrups were of wood, covered with skin, and sewed. I made both the saddle and the stirrups.

The saddles we used for racing<sup>1</sup> and for pursuing buffalo were all of this flat type.

I had neither travois nor pack on this horse. Very often, my husband went ahead to hunt; if he did not intend to go far away, he went afoot; but if he wished to go some distance away he rode this horse, while

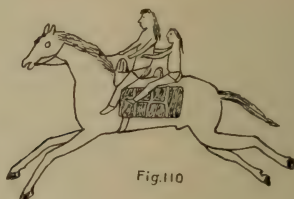
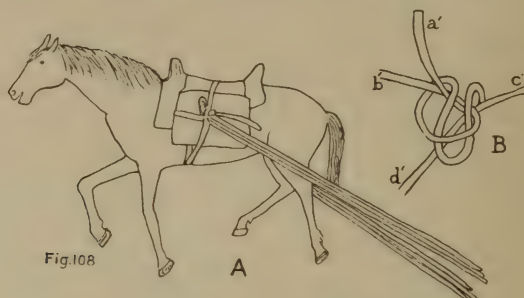


Fig. 108. Method of Loading and Tying Tent Cover on a Horse.

Fig. 109. Sketch of Horse and Two Riders to show Robe tied over Legs of Two Boys, in Winter.

Fig. 110. Sketch of Horse and Two Riders to show Position of Riders in Summer.

I stayed in line and walked. Sometimes, while still following the line, we took turns in riding and walking. It was the man's business to go ahead and hunt deer or antelope when on the march.

While riding this horse, I sometimes led and sometimes drove my mule, caring for it even when Son-of-a-star, my husband, rode the horse.

My father, Small-ankle, went ahead and I followed.

Wolf-chief's wife, Otter, rode a black pony with white legs and face. He was a gelding used in races and for buffalo hunting called Itā-tākie, or White-face. Otter also had a flat saddle and carried no burdens; and

<sup>1</sup>For a good description of an Hidatsa horse race, see Boller, *ibid.*, 66-67.

she took turns with Wolf-chief in riding. Like my husband, Wolf-chief preceded the march from time to time to hunt.

My two younger brothers, Red-kettle, ten years old, and Full-house,<sup>1</sup> seven years old, rode a three-year old blue<sup>2</sup> pony that carried a deer horn saddle and on either side bags filled with dried meat, like that shown in Fig. 95.

As the hunters brought in meat at each camp, we cured it and added to our store in preparation for the next winter. At every camp we ate some of the food we had brought with us and so emptied the bags and parfleches ready to be filled with the freshly dried meat.

A robe under Full-house was brought forward and tied by a thong over the legs of both boys (Fig. 109). Fig. 110 presents the way in which the two boys would have ridden in the summer time. In both figures it will be noted that the bags are beneath on either side. This custom of binding a robe about one in the winter time as is shown in Fig. 109 was often followed by a single rider as well as by two persons riding a pony. We called this pony, Dóoic.

My two mothers, Red-blossom and Strikes-many-women, had one horse which they took turns in riding. I have forgotten what color it was and whether it was a mare or a gelding. However, it was a two-year old and we always called such a horse Itawádä-nupac, or Two-year-old. My father, Small-ankle, who died in 1888, being a hardy walker, rarely rode this horse. When he did so, it was on the march for he never rode ahead to hunt as did my husband and Wolf-chief. At the time of this hunting trip which I think took place in 1869, Small-ankle was fifty-nine years old.

This horse, Itawádä-nupac, carried one long double sack (Fig. 96), one side filled with beans, and the other with shelled ripe yellow corn. We used yellow corn for boiling with beans.

*Dogs and Packs.* We had three dogs that dragged travois.

*The First Dog.* My own dog was a castrated male, Ūxi-tic, or Bob-tail. He was black and stood about twenty-two inches high, measuring from the ground to the level of his back just back of the shoulders.

*Dog Travois.* The travois he bore was similar to the one shown in Fig. 111. The right hand pole (Fig. 111*a-b*) lay uppermost in every dog travois; in other words, wherever the two poles made a joint, the right hand pole lay upon the left hand pole. The buffalo hide cushion which

<sup>1</sup>Goodbird says that the Hidatsa words for "Full-heart" and "Full-house" are nearly or quite the same. He did not learn until a year or two after the time of this dictation that the name should be translated Full-house and refers to the hospitality of a man who has always a "full house" of guests.—G. L. W.

<sup>2</sup>She seems to mean iron gray.—G. L. W.



rested on the dog's back was put on fur side out (Fig. 112A). It was sewed with thong in such a way as to give a smooth seamless surface underneath. (See cross-section, Fig. 112B). In Fig. 112A are two loops made of small strips of dressed skin, sewed, one longitudinally and the other transversely, on the cushion (Fig. 112, A, *b*, *c*). The loop or thong Fig. 112A, *c*, is the larger of the two. The use of these two loops is shown in Fig. 111; to the smaller is tied a short soft thong which is fastened to the breast band (Fig. 111*e*) to either end of which is tied a longer thong which passes under the larger loop (Fig. 112A, *c*). This longer thong or

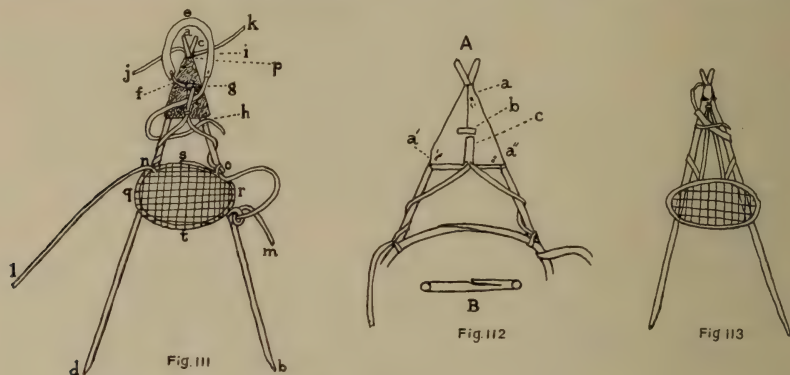


Fig. 111. A Dog Travois. The following measurements of the parts of a dog travois apply in each case to the distance between designated letters: *a-b*, 8 feet 5 inches; *a-p* (length of stump), 3 inches; *p-i* (length of cushion), 19 inches; *q-r* (width of basket), 2 feet 1 inch; *s-t*, 18 inches; *b-d*, 3 feet 9 inches; length of thong *k* (one half of neck collar), 18 inches; *l-n*, 5 feet 6 inches.

Fig. 112. Cross-section of Construction of Pad on Dog Travois.

Fig. 113. Position of Straps, Breast Band, etc., when Travois is not in Use.

strap passes around the left pole under the dog's belly and was finally tied to the right hand pole at *h*. (Fig. 111*h*.) The loop, Fig. 112A, *c*, was about three and one half inches long.

Turning now to Fig. 112A, *a*, *a'*, and *a''*, it will be noted that three thongs pass through both layers of the cushion and fasten it down: Fig. 112A, *b* is a loop already described, sewed on by passing the ends down through the cushion and making them fast on the under side. It is to this loop that the breast band is tied by a short thong (Fig. 111*f*). The longer thong (Fig. 111*g*) passes through the loop *c* (Fig. 112A), three and one-half inches long. Fig. 112B is a cross-section of the cushion, showing the method of folding the piece of buffalo skin with the seam at the top. This, of course, was so that the lower surface would be smooth and not fret the dog's back.

In Fig. 111*j* and *k* are shown the two thongs that descend and are tied around the dog's neck for a collar to hold the travois in place. This neck collar must not be confused with the breast band (Fig. 111*e*).

Fig. 112A shows two thongs which descend toward the basket from the lower edge of the cushion. These (Fig. 111*l* and *m*), are really but one strap tied at the middle to the loop *c* of Fig. 112A, the same loop through which the thong passes forming the dog's belly band. Each end, *l* and *m* respectively, is wrapped once, spirally, around its pole and bound down at *n* and *o*, respectively, to the pole and the basket hoop. The free ends, *l* and *m*, in Fig. 111 now become the straps that bind the load on the basket. These binding straps and the neck collar were never taken from the frame of the travois. When it was not in use, the pack straps *l* and *m* could be tied loosely to the neck collar, the breast band thrust under them, and the travois stood up on end (Fig. 113).

The dog travois basket was woven exactly like the wheel for the hoop game, but that for a horse travois was quite different (p. 276).

The two poles of a dog travois had very short stumps above the joint where they crossed on the neck of the dog. When a dog was harnessed, the stumps of these poles should not touch his ears or the back of his head (Fig. 116).

The Mandan dog travois and harness were exactly like those of our tribe, as was also the Mandan horse travois. The packing straps (Fig. 111*l*, *m*) were absent on a horse travois. The measurements of a dog travois will be found under Fig. 111.

*Dog Travois Loads.* The travois of my dog, Bob-tail, was loaded with moccasins and material for mending them. I had twelve pairs of moccasins, for myself and my husband, some old, some new, in a bag like that shown in Fig. 95. I also put in the bag a piece of buffalo skin about two and a half feet square with the hair on, for winter moccasins; a good-sized piece of tent skin; an elkhorn scraper; a child's cloth blanket; a round, flat stone, two and one half inches in diameter, for sharpening the scraper; a child's robe made of a piece of buffalo skin; a buffalo shoulder bone, a porous piece (Fig. 114) used in dressing hides; an iron awl; a butcher knife wrapped in a piece of skin; and a bunch of sewing sinew, as big as my two palms, containing all sorts of sinew, of buffalo, elk, antelope, and deer. At *x* (Fig. 114B) is shown the place where the bone is cut out. I do not know why we wrapped up a knife when we packed it up to carry it on a journey, but we always did; probably because it was



Fig. 114. Buffalo Shoulder Bone used in Skin Dressing; *x*, portion of the bone cut out.

sharp and might cut through the bag. Finally, the bag was tied up and covered with half a buffalo skin which we used at night for a bed cover. This was spread over it, fur down, and bound down to the baskets with the travois pack straps.

Two of the women in the party carried knives in their belts. Though I did not follow this custom on this journey I often did on other occasions. I used to hunt with my husband twice a year, once in summer and sometimes in winter, and on such occasions I carried my knife in my belt.

Of the other two dogs, one was named *Maxíte-kikcié*,<sup>1</sup> from *Maxi'íte*, a feather cap worn by the dog imitators' society and *kikci*, worn or wearing, or thing placed upon. (This cap was covered with magpie feathers to each of which was attached a weasel tail.) The dog's name may therefore be translated, Wears-feather-cap. Wears-feather-cap was a large black and white spotted dog. Small-ankle thus named him because he once killed a Sioux who wore that kind of a feather cap. This dog, a castrated male, belonged to Strikes-many-women and Red-blossom, my mothers.

The second, also a castrated male, was a large white dog with big yellow spots and also belonged to Strikes-many-women and Red-blossom. He was named *Itá-cuka-akaic*, or Took-away-his-horse.

Strikes-many-women's native name was *Mía-ahú-nikíc*; that of Red-blossom, *Óḍakapaki-hicie*, Blossom-red.

As I did not pack the travois of these two dogs, I do not know just what they carried, but I feel sure that they too carried supplies for making moccasins. I remember that a stone hammer and a round stone were part of one load. These were used for pounding dry meat, for cracking bones for making bone grease, and for pounding corn into meal. A hide was spread under the stone to catch the meal. One of the dogs carried the wooden pestle belonging to the corn mortar and a skin mortar like that shown in Fig. 92c. Some wooden bowls, tin dishes, a few horn spoons, and a brass kettle formed part of the loads. This brass kettle had a mouth about twenty inches wide and was high enough to reach to my knee. I used to boil it full of bones three times to obtain bone grease enough to fill one bladder.

The Arikara borrowed this kettle whenever the Buffalo Imitators' society or the Black-tailed Deer imitators wanted to boil water and paint their legs red; when the water was hot they leaped in, danced a few times, and then jumped out again. This kettle was originally obtained from the Arikara.



In loading this kettle on the travois, a wooden bowl was placed inside it and then an old tent skin was wrapped around it and tied. The travois on which the kettle was carried was covered with a robe which was used as a bed covering at night. The travois dragged by the second dog was covered with an old brown tent skin.

*Bull-boats.* Fig. 117 is a diagram, drawn from a model, of a bull-boat<sup>1</sup> lying mouth down over a dog travois basket. The following measurements were taken from the model, which consisted of two long poles to represent the travois frame and two ropes coiled in circles upon the poles, one representing the travois basket, the other, the edge of the up-turned bull-boat:—

a-f 8 inches

b-e 6 inches

d-g 6 inches

a-c 4 feet 9 inches

I think these measurements are approximately accurate and I have given them so that no mistake may be made in any diagram or model which you make of a bull-boat being carried on a dog travois.

*How Bull-boats were borne on the March.* I have said that we crossed the Missouri in bull-boats. These we carried with us, either on horse or dog travois. A dog could very readily carry a bull-boat made of buffalo cow skin, but a bull skin boat was too heavy for a dog. On a dog travois, a bull-boat was always bound mouth down, but on a horse travois, the boat might be lashed on either way. Very often it was bound on mouth up and kettles or pots were thrown into it; or else children, though never old people, rode in it. On a horse travois the bull-boat was bound either to the basket or to two cross bars. If the boat was to be carried mouth up, a blanket or robe was laid over the basket or cross bars, to prevent the skin from wearing; otherwise no blanket was necessary.

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<sup>1</sup>In 1910 Goodbird stated that, "The skin of a buffalo that was to make a bull-boat cover included the tail. An ox's tail is cut off. But in old times the buffalo's tail, being longer, was left intact, at least, that is as I understand it. A stick is thrust into the tail and when it dries the tail is held rigid. The stick is bound to one of the ribs in the boat. The tail is put in such a position that when paddling the boat the tail is always behind."

In paddling a bull boat the paddler kneels in the boat and puts his paddle in the water directly in front. He always kneels so that the three bottom ribs of the boat will not lie athwart the course taken; and, as I have said, with the tail in the rear of the boat."

In 1911 he stated that, "A bull-boat ought to be made as flat-bottomed as possible. This bull-boat is not very good for it is rather round bottomed. Such a boat is easily tipped. In old times the bull-boat was rather a woman's craft, though the men used it also. Often a war party would float in a bull-boat by night, down into the enemy's country, steal horses and ride back, abandoning the boat. The hide should always be hair out. Hide should be put on green from the animal. If there is a leak, thrust a little twig through the hole and plaster on inside with sticky mud. If the leak is small, the twig plug is omitted."

It was an ordinary occurrence for us to take a bull-boat<sup>1</sup> when traveling along the Missouri, so that we had some means of crossing; even hunters did this. Fig. 118 is a drawing of a bull-boat on a horse travois, made by Goodbird under my direction. It will be noted that the horse

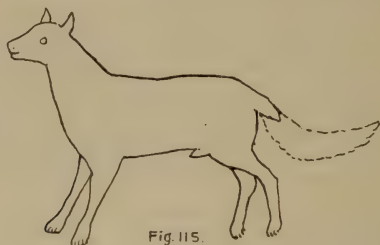


Fig. 115.

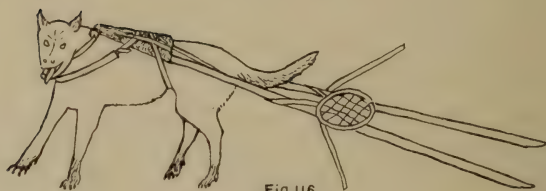


Fig. 116

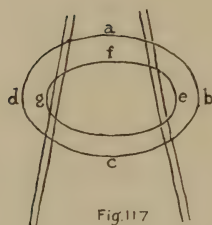


Fig. 117

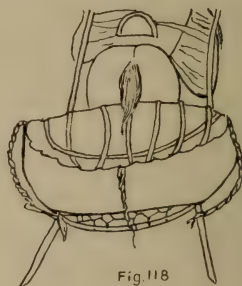


Fig. 118

Fig. 115. The Hidatsa Dog: Two Kinds of Tail are shown, Stumpy and Bushy.

Fig. 116. Travois Harness properly adjusted on a Dog.

Fig. 117. Diagram of a Bull-Boat lying Mouth down over the Travois Pole.

Fig. 118. Method of Fastening a Bull-Boat to a Horse Travois.

carries a load on either side of the saddle. The boat was tied to the travois by passing a thong or rope between the end of one of the ribs of the boats and the skin cover and thence down to the travois basket be-

<sup>1</sup>A good account of the bull-boat is given by Boller, *ibid.*, 75-77. "The squaws, inverting the bull-boats over their heads, carry them to a point above the village, and then set out on their return, reaching the shore considerably below the starting-place. The woman with their boats over their heads resemble huge black beetles crawling along the sand-bar." (Boller, *ibid.*, 77.)

For the methods of carrying bull-boats, see the sketch by Kurz, *ibid.*, 39; also, "Nach dem Frühstück war das Ufer sehr belebt; Jäger und Pferde wurden von squaws in Booten aus ungegerbter Büffelhaut über den Fluss gerudert." (Kurz, *ibid.*, 36.)

neath. It was tied in four places, before, behind, to the right and left (Fig. 117).

While it may seem strange that it was possible for a dog to drag a bull-boat on a travois for such a distance, it was not so severe a task as might appear. In old times, our packing dogs were about the size of a timber wolf. Our old dogs looked a good deal like wolves; though they had much broader faces and had strong, firm legs. The tail was usually bushy but was sometimes quite short or nearly wanting. In Fig. 115 Goodbird has drawn a picture of one of our dogs. He has drawn the tail in the two ways I have described; one is bushy and the other is short and stumpy. Most of our dogs had bushy tails, but others were common.

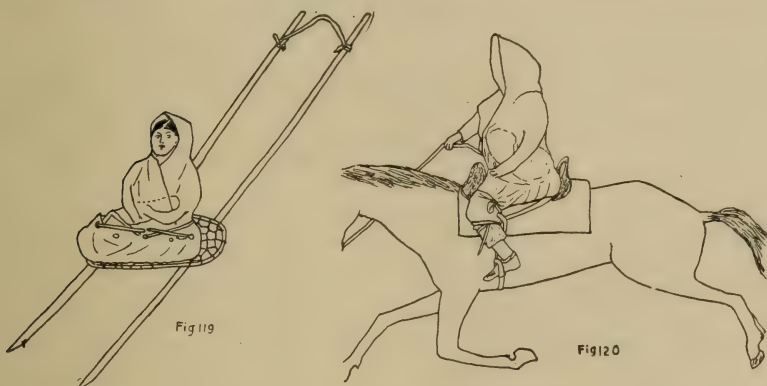


Fig. 119. Buffalo-bird-woman riding on a Travois with Feet to the Right, and holding Her Baby on Her Left Arm.

Fig. 120. Buffalo-bird-woman riding a Horse with Her Baby tucked inside her Belted Robe.

*By Travois and Horseback with my Babe.* As the weather was quite chill it was necessary to take good care of my child on the march. After the birth of my son, I sometimes rode on horseback and sometimes on the travois. On horseback, I wore a belt outside my robe and thrust my babe within, on my left side, with his feet downward (Fig. 120). If I rode on the travois, I sat as on the floor of our lodge, with my feet to the right and my child on my left arm (Fig. 119). It will be observed (Fig. 119) that the robe is wrapped about me, but I wear no belt. In his drawing Goodbird has perhaps given the robe too much the appearance of a blanket.

If an Indian woman is right-handed, she sits on the ground with her feet turned to the right; for this reason she carries her child on the left side.



In Fig. 120 it will be noted that a thong passes around my knee. When I mounted the horse, my husband drew down my skirt and robe and tucked them under to my knee. When all was adjusted, he bound them over my knees so the cold wind could not ascend and chill my body.

When I rode on the travois, I sat on a cushion of buffalo robes. Usually, two robes were spread over the basket, then a third had a thong passing through three or four of the holes always found on the edge of a robe. When I had gotten in, this thong was drawn and tied, making a kind of sack, and I sat in the mouth (Fig. 119). This again was done to prevent the cold air from chilling my body.

*Occupants of a Tent, Names and Relationship.* The following are the names of the occupants of our tent. I will first give the native names, then the age and relationship of the individuals.

Small-ankle, Ica-tsi'kipic<sup>1</sup>

Small = small of leg between ankle and calf

Strikes-many-women, Mia-ahú-diki'c

Women-many-he strikes

Bear's-tail, Naxpitsi'-úcié

Grizzly rump

Red-blossom, Odakapaki'-hiéic

Blossom red

Sioux-woman, Ita-hátsi-miac

His-arrow-long-woman

Wolf-chief, Tséca-matse-i'tsic

Wolf -man -chief

Otter, Midápökeé

Otter

Red-kettle, Midaxa-hiséé

-red

Full-heart, Nat-océé, Nata, heart, and oce, filled (Goodbird translates this later as Full-house).

Flies-low, Mikaáha-nuwic, Flies-low, goes along (said of a bird whose habit it is to fly close to the ground).

Son-of-a-star, Awáhudixic, Name of an Arikara chief.

Small-ankle was fifty-nine years old.

Strikes-many-women and Red-blossom, were wives of Small-ankle, and full sisters. Red-blossom was about fifty years of age and Strikes-many-women about three years younger.

Bears-tail, thirty years old, was a son of Small-ankle and Corn-stalk,<sup>2</sup> a deceased wife of Small-ankle. Corn-stalk was a Crow woman

<sup>1</sup>It will be noticed that Hidatsa proper names end in *c*, pronounced like *sh*, in English. It is almost equivalent to our custom of beginning a proper name with a capital letter. Thus, *máka* means a spring; but *Máhac* is Spring, a man's name.—G. L. W.

<sup>2</sup>The native word means the small extra stalk or sucker which often comes up beside the main stalk of a maize plant.

and was not related either to Red-blossom or Strikes-many-women. Corn-stalk died when Bear's-tail was about six years old.

Sioux-woman was the wife of Bear's-tail and was about four or five years older than her husband. Sioux-woman's father was a Dakota, who had married into the Arikara tribe. Her mother died but her father remained with the Arikara. In a battle with the Dakota her father was killed by his own people since they did not know he was a Dakota. Sioux-woman married an Arikara who left her; later, she married Bear's-tail.

Wolf-chief was the son of Small-ankle and Strikes-many-women. He was about twenty years old. He had been married about one year and his wife was two years younger than he.

Red-kettle was a boy about ten years of age, a son of Strikes-many-women and Small-ankle.

Full-house was a boy about seven years old, a son of Small-Ankle and Red-blossom.

Flies-low was about sixteen years of age and a son of Small-ankle and Red-blossom.

Son-of-a-star, my husband, was thirty-two years of age. This was the second year of our marriage. His father was Moccasin-string and his mother, Root. Son-of-a-star had an Arikara chief for a friend and called the Arikara, "father." When Son-of-a-star struck coup on an enemy and won an honor mark, the Arikara gave him the name of his Arikara friend, Awáhu-nakadá. Of this compound, *awáhu* is the name of a band of Arikara, and *nakadá* means "yellow" and refers to one having a light complexion and yellowish hair. In translating this name into Hidatsa, we translated it "Awáhu-dahic" which might be interpreted, "light complexioned Arikara" or "fair-skinned Arikara." It happened also that this Arikara chief had another name in his native language, which translated means, Son-of-a-star. When a census was made of the Indians on the Reservation, the interpreter, knowing that my husband was named after the Arikara chief and knowing that the chief's name was Son-of-a-star, translated this name into English as my husband's and he was so enrolled on the Agency books. This is how he came to be called Son-of-a-star, but really his name was Awáhu-dahic, or Fair-skinned-Arikara.

I, Buffalo-bird-woman was thirty years of age. My mother, Wíá'tie, or Want-to-be-a-woman, died when I was six years old. Wíá'tie was a full sister of Red-blossom and Strikes-many-woman.

*The Mandan Tent Tie.* In setting up tents, the Hidatsa used a four-pole foundation. The great advantage in employing this method was

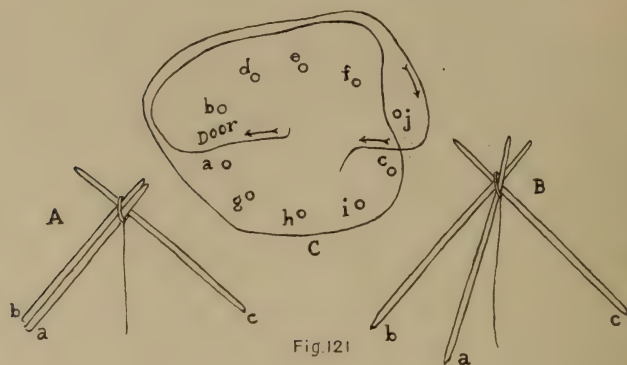


Fig. 121

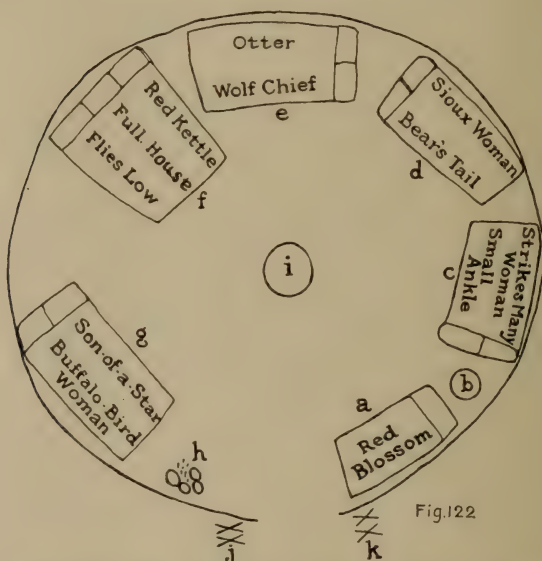


Fig. 122

Fig. 121. The Mandan Tipi: A, poles tied on the ground; B, the tripod foundation set up; C, the framework.

Fig. 122. Groundplan of Tent used on Tribal Hunt, showing Position of Beds, Fireplace, Household Utensils, etc.

that in ordinary weather it was unnecessary to draw a lariat around the top of the poles at the place where they converged to steady them and strengthen the tie. The foundation poles of an Hidatsa tent interlocked, as the fingers of the two hands may be made to interlock. The Mandan, however, used the Dakota tent tie which needs to be reinforced by a lariat drawn around the poles at the top. In Fig. 121 may be seen the Mandan



tent tie: in A, the three poles are tied together for the skeleton frame. To tie these poles, they are laid on the ground and fastened at the joint (Fig. 121). It will be observed that pole *c* projects beyond the others at the top. This is for the purpose of making the front of the tent slightly longer than the rear so that the smoke hole will be directly over the fire-place. Fig. 121*B* shows the skeleton frame after the tie has been made and the framework has been set up, while in Fig. 121*C* will be seen the groundplan of the completed framework. Fig. 121*C* (*a*, *b*, and *c*) presents the three foundation poles as already described, *a* resting upon *b* and *b* upon *c*. The remainder of the poles for the completed framework are then set up in order as shown in the following table:—

a rests upon b  
b rests upon c  
d rests upon a and c  
e rests upon c and d  
f rests upon c and e  
g rests upon c (under d)  
h rests upon g and c  
i rests upon h and c  
j rests upon a and b

The tent cover is tied to the pole, *j*, in the same manner as in an Hidatsa tent. Then the pole is raised between *f* and *c* and the tent cover drawn around the frame.

It will be noted (Fig. 121*B*) that a lariat hangs from the tie. When all the poles but *j* have been set up in the framework, this lariat is drawn out from beneath the poles, *a* and *b*, and carried quite around the frame in such a manner as to draw the poles snugly together at the meeting point. The arrows in the diagram (Fig. 121*C*) indicate the direction in which the lariat is drawn. After it has been drawn once around the poles, the pole *j*, is raised and the lariat drawn around far enough to enclose this pole. Then it is drawn inside the framework, between *j* and *c* and anchored to a short post, or pin, driven into the ground. The owner of the tent draws the cover around and laces it in place. Finally, the two poles that hold the smoke flaps are raised.

*Our Tent, Construction, and Poles.* The buffalo skin tent used by our family during this hunt was of my own construction. The hides obtained during a summer hunt were used for tent skins, for parfleches, bags, and rawhide robes, but never for robes; while those obtained on the winter hunt were tanned for use as robes, bed coverlets, bedding, and winter moccasins. This was our old-time custom. I never knew of any who used winter hides for a tent cover.

The tent we carried with us on this hunt was of thirteen large cow-skins which my husband had brought in. I scraped the skins clean, taking off every little bit of flesh that still clung to them, dried them, removed the hair with an elkhorn scraper, oiled them, and hung them in the sun. To tan a skin I soaked it in water over night and the process was completed by evening of the next day. When the skins were tanned and ready, I cut them myself. Cutting tent skins was a sacred office and followed as a profession, so that not everyone in camp could cut the skins of a tent cover.

When the skins had been cut a party of about nine women was invited in to sew the tent for me. For this work, I gave them a feast consisting of one wooden bowl full of corn balls, one kettleful of boiled sweetcorn, one kettleful of boiled dried buffalo meat, one panful of biscuits, and one kettleful of coffee. In case a tent cutter was hired in addition, special food had to be prepared for her.

The tent poles were of pine [spruce] brought to the village by visiting Crow. In spite of the fact that they did not grow on our Reservation, we always had a great many of these poles. They lasted a long time. There were fifteen poles to our tent, including the two that upheld the smoke hole flaps. The tent door was of an old cloth blanket. On the hunt, the tent door was often made of a deerskin hung fur inside so that whenever anyone went out of the tent, the fur of the door skin fell smooth against the head and body. For this reason, the fur was hung head up.

In Fig. 122 is shown a diagram of the floor of our tent.

*a*, Red-blossom's bed; *b*, articles of food piled here for safety, also any meat brought in from the hunt, skins, etc.; *c*, bed of Small-ankle and Strikes-many-women; *d*, bed of Bear's-tail and Sioux-woman; *e*, bed of Wolf-chief and Otter; *f*, bed of Red-kettle, Full-house and Flies-low; *g*, bed of Son-of-a-star and Buffalo-bird-woman; *h*, dishes, bowls, cups, spoons, and the like used at meals, piled here when not in use; *i*, fire-place, *j* and *k*, firewood.

Dr. Wilson adds:—

A study of the arrangement of the beds of the tent of the Small-ankle family and of that of the arrangement of the beds in the earth-lodge as shown by Goodbird's diagram, reveals quite a marked contrast in the plan. It will be noticed that the arrangement of the beds in the tent gives precedence in age, beginning at the left, as one faces the door from within; while in the earth-lodge precedence is given, beginning at the right. Thus, in the tent the first bed on the left is Red-blossom's, the oldest of Small-ankle's two wives. Next is that of Strikes-many-women; then comes that of Bear's-tail, the oldest son; then of Wolf-chief, a younger son; then of Red-

kettle, bed of Buffalo-bird-woman and her husband. Buffalo-bird-woman is a daughter and of course, Son-of-a-star is not properly a son of the household.

Questions put to Buffalo-bird-woman did not reveal any strong realization of the idea of precedence. When asked why the beds were arranged in this manner, she simply replied that it was custom, or that it was always so, and some of her answers apparently more intelligible, were answers to some leading questions and I have therefore omitted them as being valueless. It will be noticed, however, that the beds are laid head to head and feet to feet, or heads and points, as the early English accounts of Eastern Indians put it. The exception is the bed of the three boys, Red-kettle, Full-house, and Flies-low, but this Buffalo-bird-woman explained was because there was not room enough to put all the beds lengthwise, and this particular one was turned with the feet toward the fire in order to make a little more floor space. I questioned her very carefully whether the beds were so put so that the children would have their feet to the fire, and was very careful not to put any leading question, but I could not draw out any such idea from her.

I could not draw from her which of Small-ankle's two wives was his favorite wife. But as a rule she spoke of Red-blossom's bed in those terms, while the bed of Strikes-many-women was usually called the bed of Small-ankle and Strikes-many-women. The same thing was observed when she spoke of the beds in the earth-lodge, but she spoke occasionally of Red-blossom's bed as that of Small-ankle and Red-blossom. In the earth-lodge diagram, the bed is spoken of by Goodbird as the bed of Small-ankle and Red-blossom. It will be noted in this diagram that the bed, *j*, belonged to Red-kettle and his wife, and is lower down in the scale than the bed, *h*, of Buffalo-bird-woman and her husband. Red-kettle was a younger brother of Buffalo-bird-woman, but here again, bed *i*, is that of Flies-low, a younger unmarried brother.

It will be seen that both in the diagram of the tent and in the diagram of the earth-lodge, the beds *f* and *l* respectively, belonging to young boys, are placed toward the lower end of the line, but not at the extremity. Now whether this was done for the purpose of protection to the children, I could not discover. It may be that bed, *j*, in the earth-lodge was erected after the marriage of Red-kettle and was put in this position merely because the occupants of the other beds already had their places determined, and had become accustomed to them.

The question of precedence and dignity in the family has been a difficult one for me to draw from Buffalo-bird-woman as it was so evident that her ideas of the rights and dignities in an Indian family differed so radically from mine, and because with her the sense of tribal community in a measure drowns out the question of rank, but it may also be that my own comparative ignorance of this subject may be the cause of my lack of success in getting at the desired information. It is very likely that further study may reveal what I have not yet been able to obtain.

But apparently the heads and points arrangement of the beds is not observed in the earth-lodge as in the tent. Goodbird speaks of the dislike of the Hidatsa of having the beds lie with the head toward the east, but Buffalo-bird-woman says that this custom was not always observed.

We placed our beds in the tent in the same manner as that described when my husband and I and five other couples went on a hunt afoot (Fig. 77). Between each bed and the fire, lay a log. The space between the log and the tent wall was filled with grass and the whole covered with



robes. The logs were laid in this position for two reasons: to keep the shape of the bed and to prevent the sparks from the fire from setting fire to the grass. These small logs were placed near the bed when wood was plentiful, especially if we expected to camp in the locality for some time. When we camped in the hills where wood was scarce, or if for any reason we were in a great hurry or it was inconvenient to obtain logs, we did not use them. In the diagram (Fig. 122), the boys' bed did not have these logs since it was turned around with the feet to the fire and there was no need of them. The bed was thus turned because there was not room enough for it to lie lengthwise in the tent.

*Naming Goodbird.* When Goodbird was ten days old, we called in Small-ankle to name him. It was a common custom to call in some older person, whom we esteemed highly, a friend of the family, or a medicine-man, to name the child. Such a person was presented with food and other gifts. In this case, nothing was presented to Small-ankle since he was a member of the family and related to the child.

Small-ankle picked my little son up in his arms, and said, "His name shall be Tsakáka-sakie." I do not know why he called him by that name, but perhaps he was thinking of the gods. We believed in thunderbirds. The thunder is the roar of the bird's voice and the lightning is the flash that comes when he opens his eyes. We Hidatsa worshiped the thunder spirits a great deal.

*Descending the Missouri in Bull-Boats.* Throughout the winter we camped at a place called Round Back, on Bark Creek, where there was no timber. We built neither cabins nor earth-lodges, but lived in tents and kept warm by means of the fires we built in the middle of the tents. Though we had not been successful in our hunt on the Yellowstone, we had plenty of meat for the winter, for we found buffalo three times before the winter was over and our men were successful each time.

Before we broke camp in the spring we held the ceremonies of the Goose Women society<sup>1</sup> and hung up meat. Most of the members of the tribe returned to the Yellowstone, but Small-ankle's and One-buffalo's family, two tents in all, went up the Missouri, where we found ten buffalo and made a killing.

After we had killed these buffalo, four more tents caught up with us, those of Strikes-back-bone, Old-bear, Long-wing and Spotted-horn. To each of these my father gave one whole buffalo skin for making bull-boats and one half a buffalo carcass. The meat was not dried. Besides

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<sup>1</sup>This series, vol. 11, 330-338.

the buffaloes, he had also killed three elks and Wolf-chief had killed two or three deer. The meat was brought into camp by dog and horse travois and was dried there.

In April, as soon as the ice broke on the river, and the ducks began to come north, we moved back to the Yellowstone, where we built new bull-boats. Our family already had one which they had brought from Like-a-fish-hook village. I had previously made two boats and now made two others, making five in all. One morning, when all was in readiness, we took the boats to the river. My husband and I loaded one with dried meat; we bound this boat firmly to another, which we entered. We placed as much dried meat in our own boat as we could safely carry, also a gun, and an ax. In the boat which was bound to ours, we put a much larger load of dried meat and hides, besides Small-ankle's son, Flies-low, a boy about seventeen years of age, and my little son, Goodbird. Flies-low carried the baby in his arms. A third boat, loaded to its utmost capacity with hides and dried meat was bound to the tail of Flies-low's boat.

My husband, Son-of-a-star, and myself paddled with two oars. Following us came my two mothers, Red-blossom and Strikes-many-women. They also had a boat bound to their own, at the tail of which Strikes-many-women had tied our tent poles so that they would float in the current. We had thrown away all our dog travois which we had brought from Like-a-fish-hook-village.

My father, Small-ankle, followed along on the opposite bank driving our horses. He did not drive them along close to the water, but back on the edge of the foothills. Sometimes, Wolf-chief went with him and helped him; sometimes, all the men accompanied him; especially, if they wanted to hunt. The rest traveled in their bull-boats. There were ten boats in the entire company, five tents beside our own: Spotted-horn, Guts, Old-bear, Strikes-back-bone, and One-buffalo, and our own tent. Spotted-horn and Old-bear came along on the bank, driving their ponies. Guts and One-buffalo and Strikes-back-bone each had boats. Spotted-horn's wife also came in a boat.

In Fig. 124 is a diagram drawn by Goodbird under my direction, giving the order of the boats and their loads.<sup>1</sup>

Sometimes the waves became quite choppy from the wind or the current at some places was unusually swift. This was especially true

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<sup>1</sup>There seems to be a slight discrepancy between the number of boats in the diagram and the number enumerated by Buffalo-bird-woman. In such cases, the diagram should probably be given preference, as an error is much more likely to be made by the interpreter in the translation than in the drawing of the diagram.—G. L. W.

when we came to a point in the river where the wind was directly against the current. At such times we all drew together and grasped the gunwales of each other's boats in our hands (Fig. 123). Boats thus bunched

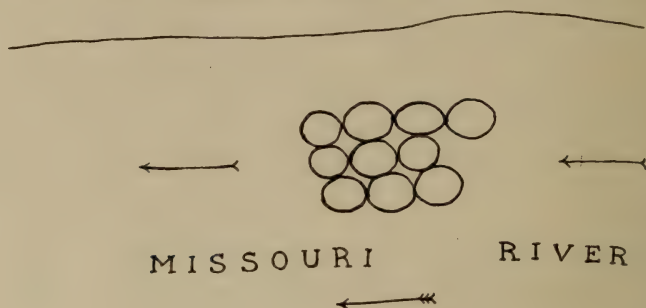


Fig. 123

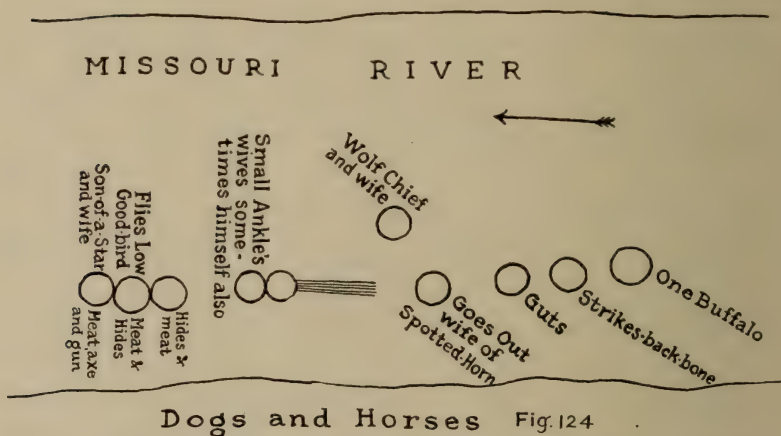


Fig. 124

Fig. 123. Diagram showing Method of bunching Bull-Boats to prevent their Overturning in a Strong Current.

Fig. 124. Diagram showing the Order of Bull-Boats as they floated down the Missouri.

together could ride through a choppy current much more easily than a single boat. However, we did not tie these boats together, but merely drew them close with our hands. We loosed them again as soon as the dangerous part of the current was passed.



*Goodbird is nearly Drowned.* At the mouth of the Little Missouri River, we almost had a fatal accident. When we left our winter camp in the west, the grass was growing and the snow had disappeared, but as we came down the Missouri, a snowstorm came up very suddenly. A strong wind blew; as we rounded the bend at the Little Missouri River, the water was very rough and the waves tossed our boats around so that we were all frightened. Of course, we turned toward the shore, both my husband and I paddling vigorously. Usually, in paddling a bull-boat when a husband and wife are together, the wife kneels in front and paddles while the husband sits in the tail of the boat to balance it (p. 256). Coming down the Missouri, towing a load, was a more difficult operation, so both my husband and I paddled side by side in the boat. Suddenly, my husband stopped paddling and leaned over the side of the boat so far that I was nearly pitched over on his side. A bull-boat is a clumsy, tub-like craft, easily upset. My husband leaned over so far that the edge of the boat came clear down on his stomach. "He has dropped the child," I heard him cry, and saw him lift my baby into the boat. "*Iná*,"<sup>1</sup> I cried, but I had presence of mind enough not to drop my paddle. Indeed, we could not have reached shore without our paddles.

As I have already explained, Flies-low, my younger brother, was in the second boat, holding my son, Goodbird. It was customary when a young child cried, to loosen his cradle clothes. After my husband drew the child into the boat, I found that Goodbird's clothes had been so treated. Probably the child had become restless and Flies-low had loosened his clothes a little to give him room to move his limbs. This loosening of the cradle wrappings had made them buoyant, so that the baby floated on the water and my husband was able to rescue him.

We came ashore without any further mishap and camped in two tents. It began to rain, then the weather turned colder and a heavy snow began to fall and continued for four days. Many of the summer birds had already come north and when the storm was over we found some of them frozen to death.

My father, Small-ankle and Charging-enemy, who were driving the horses along the bank, did not stop to camp with us, but hurried on through the storm to Like-a-fish-hook village. They reached the village safely and drove the horses down into the timber. In the summer time, when the air is a little chill and one goes bathing in the river, it always seems warmer in the water than outside where the chilly wind

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<sup>1</sup>An exclamation of alarm.

strikes one. Down in the timber where we drove the horses there were some ponds, and the horses found it was warmer to stand in the ponds than to remain out in the snow and storm. They waded into the water and stood there. Of course, they had to come out after a while and as the wind was blowing very cold, they became chilled. Three of them sickened and died: a mule, a mare, and the shaggy horse. Another man in the village lost eight horses and still another, ten horses, in this same way. After the storm was over, our company re-embarked and paddled safely down the river to Like-a-fish-hook village.



Fig. 125. Flies-low in a Bull-Boat holding the Infant Goodbird in a Storm.

Goodbird was crying lustily when we drew him out of the water, but was not choking or strangling. I do not think that his face got into the water at all. I do not remember now whether Flies-low made any outcry when he dropped the infant into the river or not. I did not scold Flies-low. "I am not to blame," he said. "I tried to hold the baby, but that boat seemed to turn upside down and the baby fell out of my arms."

We knew this was true, so we said no unkind words to him. In Fig. 125 Goodbird has drawn a picture of Flies-low riding in the boat with Goodbird in his arms. The wavy lines on either side of the boat are the waves of the Missouri, and the dotted lines show how the boat rocked in the waves. This is not exaggerated. When a windstorm blows against the swift current of the Missouri, the waves become very high and are always dangerous.

## WOLF-CHIEF'S HUNT WITH DOG AND TRAVOIS

In August 1911 and August 1915, Wolf-chief related the following account of a hunt made with dog and travois.

In the spring of 1866, when we were living in Like-a-fish-hook village and I was about seventeen years old, my father, Small-ankle, invited me to go with him to Little Knife Creek to hunt beaver. Little Knife Creek is a branch of the Knife River and is now called Spring Creek. Our five villages once stood at the mouth of Knife River.

*Horses and their Equipment.* We saddled two horses for mounts and in addition took three extra horses, one of them saddled with a flat saddle, as he was a buffalo horse, a racer. My father rode ahead and led one horse; I followed, also mounted, and drove the two remaining horses before me. Four of our horses bore frame saddles of horns of white-tailed deer. Such saddles were considered better than those of wood, since they did not gall the horse's back. My father was a good saddle maker and kept his saddles in good repair. Our extra horses were not loaded.

Tied to the rear of the saddle that Small-ankle rode were two steel traps with the chains tied together and wrapped in a piece of tent skin. He had rolled up two pieces of tent skin and had laid them behind my saddle and bound them to my saddle horn. My father and I each had two robes. I doubled one of my robes, flesh side up, and threw it over my saddle; my father did likewise. As we rode, we each wore a new robe, fur side in, belted about the body.

*The Dog and Travois.* We had one dog and travois and on the travois we carried a small hatchet, a hoe, and a small brass kettle, also some parched corn balls and pounded parched corn for mush. All these we wrapped up in some canvas we obtained from the soldiers.

The dog's name was I'ta-c'ipihě-dákapec, or Face-painted-black-killed. I had once owned a very gentle old dog and named this dog after him. The dog followed along in the rear. As we did not care to hurry, we did not travel very fast. We knew the place we were going to was only about forty miles from Like-a-fish-hook-village and we could reach it before sunset.<sup>1</sup>

*Weapons and Ammunition.* My father had a muzzle-loading flint-lock and I had a short-barreled percussion rifle and my bow and arrows. My bow was of elm wood and I carried eighteen iron-headed and four blunt-headed arrows in my quiver. We still used arrows at that time.

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<sup>1</sup>He probably means sunset of the second day.—G. L. W.



We used our guns in battle with our enemies and to kill deer and antelope; but powder was scarce and not much used in hunting buffalo.

*Snowblindness.* It was in the month of March. There were two or three inches of snow on the ground and I remember that when our dog became thirsty he ate snow. The sun was shining brightly and the glare from the snow made me snowblind. When we camped that evening my eyes hurt frightfully. I felt as if sharp sticks were thrust into them.

*In Camp.* We reached the camping place and dismounted. My father untied our dog from the travois. He was a good dog and not very tired. As soon as the travois was removed he rolled in the snow, getting up and shaking his hide, but not barking. We also unloaded our horses, but did not hobble them. "They are tired and will not stray far," said my father. We had made about twenty miles that day.<sup>1</sup>



Fig. 126. The Tent used during Wolf-chief's Hunt.

*Setting up a Tent.* Our horses attended to, my father began putting up the frame of our tent. He raised the travois, stayed it against a forked pole, and against these leaned other poles, which he brought from the timber. Fig. 126 is a sketch of the tent drawn by Goodbird after my description. It was about six feet high and I remember I had to stoop a little as I stood within by the fire-place. It was covered with three pieces of old tent skin, two at the front and one at the back. My father pierced holes in the skins with

his knife and through the holes drew thongs to lace the skins together. At the front of the tent, the edges of the upper skin did not meet, but the space thus left open was filled in by the netted thongs of the travois basket. The door was under the travois basket. Its covering was a saddle skin with the head cut off, hanging fur side in. As will be noted in the sketch, the tent was tied in front in two places.

*Hunting Badgers.* I had bound a handkerchief over my eyes and tried to help my father. "Make a fire," he said, "I want to see if I can get a badger. There is a prairie dog town near by, and badgers are commonly found near a prairie dog town." My eyes hurt me so that I

<sup>1</sup>Wolf-chief apparently said that the first day's journey was forty miles (p. 299). It would seem that twenty miles is correct.—G. L. W.

was afraid to make the fire lest the glare make the pain worse. I went into the tent and lay face down on my saddle skins, with my dog beside me.

*The Evening Meal.* My father soon returned. "I have a fat badger," he said. He dressed it, made a fire, put the meat into our kettle and added some mint blossoms and chokecherry bark which he had gathered when he was hunting the badger. "They will give a fragrant smell to the mess," he said. He boiled the meat in water from the creek; when it was boiled, he threw out the water and added fresh water. Badger flesh is rather strong and must be parboiled. "Come and eat," said my father. "No," I answered, "my eyes hurt so that I don't think I can." He laid three short sticks before me and put one side with the ribs on them. I rose and ate heartily. "I will give you more if you want it," said my father. "It is pretty good," I said, and my father gave me another piece. I had never eaten badger meat before.

*Watering the Horses.* Because I was afraid the light would hurt my eyes, our fire was outside the tent, but as it was not dark yet, we ate inside. Then my father said, "I must water my horses." He went off to find them. After watering and hobbling them he returned and said, "I have seen no tracks of beaver. The creek is still covered with ice." He watered his horses at a place where the river was shallow and the current ran swiftly over the stones. Such places often remained unfrozen throughout the winter.

*Interior Arrangement in the Tent.* We went to bed, my father on the north side of the tent; I on the south. My dog slept at my side. Our saddles were laid against the tent wall. In this case, we did not use tent pins or stones to hold down the edge of the tent covering; it merely hung to the ground. The floor of our tent had been scraped free of snow with our hoe. We had brought the hoe with us to scrape the snow from our camping places. Our guns lay near us. "Put your gun beside you," my father had said to me. "If enemies fire at our tent, pay no attention to anything, but seize your gun." I laid my gun between myself and the skin covering of the tent with the barrel pointing in the same direction as my head. We had a small fire outside our tent. We carried with us one drinking cup.

*Cooking Bones.* We remained at this place all the next day. My father went afoot up the river to look for game. He found a pile of bones left by a party who had killed buffalo; and brought back as many of them as he could carry, as they were fresh and had not spoiled in the cold weather. He brought them for the bone grease (marrow). I do not

know whether he carried them in his arms or on his back. My eyes hurt so that I did not see them. "There are the remains of a Sioux camp not far away," said my father. "I found these bones there. They must have killed a great many buffalo since they left these bones lying on the ground." He went outside the tent and pounded the bones with our hatchet (small ax) and cut them up. "I have found a great deal of grease," he said. He meant, of course, that the bones were rich in grease. "A short distance from here, I found something very good to eat," my father said, as he showed me some kind of a mushroom which we call *mída etaně"pa*, from *mída*, wood, and *etaně"pa*, navel.

*Mushrooms.* After taking out the bones, my father put the mushrooms in the broth and boiled them. They were very good and tasted something like squash. I had never eaten them before and never since then. I do not know whether my father learned to eat them from white men or Indians but I do not think he learned of their use from white men.

*Treatment for Eyes.* My eyes hurt for three days. My father dropped some gunpowder in my eyes to cool them. Snowblindness sometimes turns the eyeball white. "If after you are well," said Small-ankle, "we find a white spot on your eyeball we will chew a piece of straight sage leaf mixed with charcoal and slip it into the eye. This will remove the white spot." I have heard of this remedy from other members of our tribe. Wolf-grass once told me, "I once accidently whipped my horse over the eye when chasing a buffalo. I chewed sage and charcoal and spit it into his eye. The horse shut his eye and shook his head. I repeated this three times. The white spot on my horse's eye will never appear again." My father was familiar with this remedy. The gunpowder hurt my eyes a little, but felt cool, nevertheless. My father wet a little on his palm, I lay on my back and opened my eyes and he dropped a little of the wet gunpowder on my eyeball.

*Capturing and Eating Porcupines.* We stayed in this camp for three days and then moved up the river about fifteen miles, to some small timber in a coulée. As we approached the timber I saw something move and called to my father, "What is that ahead of us?" "A porcupine," he answered. I gradually raised my head, and sure enough, a porcupine was running toward the timber. It was going rather fast. "Let us camp here," said my father, "and we will have porcupine for supper." We dismounted. My father cut a stick and killed the porcupine. When a porcupine is frightened he tries to hide in the bushes. My father struck the porcupine on the head; he dragged the animal to camp, holding it by a foreleg to avoid the spines. "Make a fire and burn off all the hairs and quills, and we will eat the skin," he said.



I built a fire and held the porcupine over the coals. When the quills were all singed I scraped them off with a stick. I opened the belly and skinned the animal, leaving all the fat and some of the meat on the skin. I took off the skin and fats and adhering flesh, but without any bones clinging to it. I roasted this fat skin. I cut a green stick forked at one end in three tines like a white man's fork. On these, I laid the porcupine skin and held it over the fire. After the entrails were removed the rest of the carcass was broiled. While I was broiling the porcupine skin my father said to me, "I saw another porcupine in an old cave in a bear's den. I think it will be easy to dig him out." He took a hoe, went down to the den, and built a fire to thaw out the ground. While he was doing this, I called out to him, "This fat skin is done." The porcupine skin had been taken off in two pieces, one piece from each side; but I had broiled only one piece which I laid on the grass. It was very good, quite fat and very tasty. After supper, we went out for the other porcupine. My father dug and I helped him. We dug about six feet. Then my father looked into the hole and pushed a long stick into it. "It is still a long way in," he said, "but I think you can crawl in and get the porcupine. Bring one of those ropes we used for tying our horses." I brought two thong lariats. He tied one of the lariats to my foot. "Creep in," he said, "and when you touch the porcupine try to tie its two hind legs with the other lariat. As soon as you have done this, shake your foot, and I will draw you out by the lariat while you crawl backwards on your elbows."

I took the rope and crept in for some distance, but did not see the porcupine. It was very dark in the den. I began to perspire. I crept on, but the air was exhausted and I could not breathe. I went a little farther and touched the bed of the porcupine. Feeling around carefully with my fingers, I touched the porcupine. My breath was coming in long-drawn gasps. I felt around for one of its legs, tied the second lariat to it, and shook my foot. I tried to crawl backwards on my elbows, but felt very weak. My father pulled and I came out. The porcupine had taken possession of an old bear's den that had partly caved in and the roof was so low that I could hardly thrust my head under, but the hole was wide enough for my body. "What is the matter?" cried my father, when he saw me. "I do not know," I answered. "My breath is all gone." My father brought some snow and said to me, "Rub this over your face and head." I did so and felt better. However, I was very weak and lay down on the side of the hill and thought to myself, "I nearly died in that hole." Meanwhile, my father pulled on the rope tied to the porcupine's foot, but he could not pull the porcupine out. "Can you help me?" he

asked. "No," I answered, "I am too weak." I rubbed some more snow on my head and face and felt somewhat stronger. My father and I seized the lariat, the porcupine's hold was broken, and we pulled him out slowly. I think he had found something to hold on to and that was why my father could not pull him loose at first. Small-ankle killed the porcupine with a blow on its head with a stick. I had tied the lariat to the porcupine's right foot. I knew that the porcupine would not fight when attacked and for that reason I was not afraid. When I went into the porcupine's den I wore mittens and when I felt around for the porcupine I slipped my hands palm downward flat on the ground. I knew that a porcupine when disturbed would shake its tail, but the animal always does this with an upward motion, never downward or side to side. Sometimes when a porcupine shakes its tail the quills fly out.

When we returned from the porcupine's den my father burned the bristles and hair from the animal and skinned it, just as I had done with the first one. He cut the meat from the sides and legs in strips, tied them together, put a pole over the fire, and slung the strips over it to smoke them. The meat from one whole porcupine and of half the other was thus smoked. My father boiled half of one porcupine. The next morning my father boiled the smoked meat and I found that smoking it had made it sweeter.

*The Smoke Offering.* From this camp we went on about fifteen miles and camped in some box elder timber over night. The next morning we continued up the river and turned north. Now my father became snowblind. "My eyes have been snowblinded," he said, "look to the north and you will see some high ground called Women's Butchering Trap." North of that is a lake where one can always find buffalo. We will camp there. We Hidatsa believe that buffalo have their home in this lake." We arrived at the hill called "Women's Butchering Trap" and climbed it. "Look to the northwest," said my father, "Do you see any big timber?" "Yes," I answered, "about twenty miles away." "That is it," he said, "we call the timber, Facing-across-the-river. Now I want to smoke."

My father dismounted, filled his pipe, and smoked, offering some of the smoke to all the gods of the world. Holding the pipestem at an upward angle and towards the northwest, the direction in which we were going, he cried: "O, you gods in this world, smoke. I want to have good luck in everything in this hunt." Then he ate.

*The Buffalo Hunt.* We mounted our horses again. Below, we saw some tracks in the snow. When we came up to them we found they were

buffalo tracks. "There are buffalo tracks here, father," I called. "Good," he said, "the tracks lead in the direction of the lake." Take your race horse and chase the buffalo." I took off my robe. I wore a coat of white blanket cloth with black stripes. "I will use my arrows," I said. "No," said my father, "take your gun. These are a bull's tracks and a bull has a tough hide." "All right," I answered and took my gun.

I soon saw the bull lying beside the lake. He fled and I followed. The bull floundered along in the rushes and snow, breaking through the thin ice, but running very fast, so that my horse gave out. I turned and spied three more buffaloes on the east side of the lake. I was now on the south side of the lake. I returned, glad to leave the rushes and the snow, and met my father, and said to him, "My horse has given out and that bull is also mired in the snow." "What kind of a bull was it?" asked my father. "A sharp horn," I answered. "They are always strong," said my father, "he will get out all right." I told my father of the three buffaloes I had just seen on the east side. He said, "I want you to chase those three buffaloes; I want you to kill a fat one. At this time of the year the fat ones have a patch of black hair over the eyes for the fat under the skin makes the animal shed earlier and the new-grown hair is very black. Also, there is a black stripe on the highest point of the spine over the shoulders and there is a little black hair around the horns."

"All right," I said. I went on and found the buffaloes lying down. As I approached they jumped up and ran. I followed, picking out one with the black spots as my father had described; the hair of the others was a dull brown in the spots. I aimed at this one, but as I had never used a gun before, the barrel shook in my hand and I felt sure I could not hit the buffalo. Nevertheless, I rode close to the side of the animal and fired. I guess I hit the buffalo in the leg, for he kicked. I tried to load my gun, but could not with my horse running, for I spilled my powder. I slowed down and loaded my gun, ramming the bullet home with a little piece of cloth. I gave chase a second time and saw that the buffalo was a little lame. I fired; he kicked again, but went right on running. I stopped to load again, then I drove the buffalo in a circle around toward the camp. My father saw us coming; I heard a shot and when I came up saw my father on one side of the hill, waving his gun and calling, "This is the way a man shoots. What have you been doing?" he was making fun of me.

The next day we started back to Spring Creek. The ice on the river was not yet broken and though we had seen some beaver dams we had



killed no beavers. However, we discovered a herd of five buffalo bulls on our way. "I want to give chase to those buffaloes," I said to Small-ankle. "Good," he answered, "but you had better take your gun. I fear you are hardly strong enough in your arm to use arrows." "Yes I am," I said. "Have you not heard that I have already killed a grown buffalo with an arrow?" "I think you should take your gun," said my father, "but use your arrows if you will. Now let me tell you again how to judge if one of the bulls is fat. As you come close, observe if the hair along the spine and just back of the eyes is black. Those so marked are the fat ones."

The reason of this is that the black hair marked where the buffalo had begun to shed his hair. Under the black spots were layers of fat that in these places made the buffalo shed a little earlier than his leaner fellows. But such a sign was of value only in the spring and was found only on bulls, not on cows.

I mounted my horse, a large gray one without saddle. I wore a coat made of a white wool blanket, bound about with a belt. I tied my quiver to the left side of my belt, and gave chase to the herd. Observing one with the signs my father had described, I singled him out, and soon caught up with him. Coming very close and knowing just where to shoot, I released my arrow. It sunk in half its length. I followed a little way until I saw blood gush out of the buffalo's mouth. Then I reined in.

The buffalo slowed down, stopped, and stood swaying. More blood flowed from his mouth and his fore legs bent under him. He tried to rise, sank again; tried once more to rise, but could not, and fell over on his side, dead.

He lay on his left side, with my arrow sticking out of his right. I thought to get my arrow, then said to myself, "No, I will bring my father here and show him how I can kill a buffalo with an arrow." So I mounted again, for I had gotten down to get my arrow.

Small-ankle sat on a little hill awaiting me. "How has your hunt come out?" he called. It came into my mind to have a little fun with him. "Badly," I answered, "I did not kill one!" "I told you that you could not kill a buffalo with your arrows," he said. "You would not take a gun when I urged you."

I laughed and answered, "Mount your horse and come and see." I led his horse, both of us mounted; my father had covered his eyes, as they pained him greatly. Snowblindness was a common trouble with us in the spring.

We came to the dead buffalo. "There," I exclaimed, "see that!" "My father uncovered his eyes a little and saw the buffalo. He put his hand to his mouth in astonishment. "You have shot it just like a man," he cried. "Now sit down and rest yourself and I will dress the carcass for you. This is the fattest bull I ever saw." He knew the bull was fat from its looks.

*Butchering.* My father skinned the bull, cut out the meat for drying, and laid the pieces on the sod where the snow had melted and left the ground bare. When he had done, he opened the belly and pulled out the intestines and paunch. In the cavity of the body was now some warm blood.

"I want to drink some of this blood," said my father. He filled his joined palms and drank two or three times. "You do likewise, my son," he said to me. "If you are going to eat the fresh liver and kidneys and that part of the paunch"—(he meant the part that is filled with thin stuff like leaves)—"you should first drink a little blood. It will save you from getting sick in the stomach."

I drank some of the blood, but did not like it. "You need not drink much," said Small-ankle. "You have drunk enough to keep the raw liver from hurting you."

*The Tent Collapses in a Snowstorm.* We camped at night on a hill and Small-ankle made bone grease. A storm came up and it began to snow. "We must move our camp down into the timber," said my father. "Our tent may blow over up here." The next day we moved our tent down in a coulée out of the wind and pitched it in a place near a big tree where it was protected by some bushes. It snowed all day. In the evening it was still snowing, but we went back to our meat pile near our former camp on the hill to take our meat back to our tent. Snow was still falling when we went to bed. I slept that night on the west side with my head toward the rear of the tent. The tent door was toward the south.

Our tent poles were small and not heavy enough to support the weight of the snow. I do not know how it happened, but apparently the snow on the side of the hill above us on the west drifted and came down upon me. My father awoke during the night to find the tent giving way and weighted down with the snow. The space inside the tent was reduced almost to nothing. He sprang across and found me under the snow, unconscious. He carried me to the farther side of the tent, sang a mystery song, and felt my heart. Like one in a dream, I heard him singing. Gradually, my senses returned. "Are you alive again!" cried my father. "Yes," I answered, my breath coming in gasps, as I sat up.

My father held me in his arms, as I sat on the ground, but I was able to sit up right only by leaning my head against the tent wall. The wall was icy cold, but I could not sit up otherwise. "I once heard," said my father, "of a tent being covered with snow. The people inside hit the walls of the tent with their hands and kept the snow from crushing it to the ground." He struck the tent wall repeatedly at one side, driving back the snow and packing it; after a while he had quite a space cleared. "You sit here," my father said. I moved over to the side where he had been working and he attacked the other side of the tent. At last, he had the tent restored to something like its normal shape.

I suppose I had been pressed down with the snow and was dead (fainted). As I have said, my father felt with his hand and felt my heart beat. He put water on my face and sang mystery songs until I revived. In the meantime my dog was running around over head.

"Father, I am hungry," I said. "I don't wonder," answered my father, "I think we have been here for three days. You ought to be hungry." He took two boiled buffalo tongues and one buffalo heart from a bag which lay on his pillow. We ate all the meat, for we were hungry. I felt my face and hands and said, "Father, I am well now." "Good," he said, "Let us try to find our hoe. I laid it just outside the door." We both worked at the door, pushing and shaking it until finally my father worked his way out and I heard him cry, "I have found it." I still felt very weak. All this time our breath froze as soon as it struck the cold air. There was no fire in the tent and I found that the hood that formed part of my coat was torn off at the neck. Doubtless, it had frozen to the ground and had been torn off when my father pulled me from my bed. My father had just found the hoe when suddenly we saw light above. Before this it had been quite dark. It looked as if the snow up there was not very deep. "I will try to push a hole through that place," said my father. He pulled a buck brush from his bed and tearing off a piece of his shirt, he bound several of the buck brush sticks together, reached up, and punched a hole in the snow above the smoke hole of the skin tent. We saw that it was daylight and the snow was still falling. The air coming down the smoke hole made me chilly.

My father now dug with the hoe into the snow at the door and as he dug I kept shoving the snow back into the lodge. We both wore our mittens, but my father covered his head with a saddle skin set over his hair like a cap. He cut holes in the edges of the saddle skin where they overlapped and stuck a stick through to skewer the edges together. This saddle skin cap prevented the snow from falling on his bare head, as he



was digging a tunnel through the snowdrift. He had tunneled for a distance of about twelve feet when he said, "My knees are very cold, will you try to help me?" I put on his cap (Fig. 127) and went to work. I threw the loose snow back into the lodge, quite filling it. We continued to work in this manner and finally I broke through the drift about eighteen feet from the tent. We had worked on our knees and dug a tunnel high enough to kneel in; the snow was at least ten feet deep. The mouth of the tunnel was about eighteen feet from the lodge and breast high from the ground, for we found that we had not tunneled along on top of the ground at all.

When I finally reached the outer air I found that the day was quite pleasant and not very cold. We had noticed geese going northwest before the storm came up. As my feet touched the ground, I shouted "Good," and as my father appeared, I cried out to him, "I see only the head and shoulders of our race horse." "That is unfortunate," answered my father, "perhaps the other horses have perished."

Small-ankle and I dug the horse out with our hoe. When we had dug the snow away from one side, he fell over, as he was unable to stand when no longer supported by it. We built a fire to warm the horse. He bent his legs and stretched them. I gathered some dry grass from the side of the hill and fed him. We also warmed the saddle skin my father had used as a hood and rubbed the horse's legs with it. "Try to rise," my father said to the horse, "and I will make an offering of red cloth that you can wear as a necklace. I will do this as soon as we return to the village." We worked over the horse a long while. Finally, I seized him by the tail while my father held his head and together we raised him to his feet. He fell again and I raised him, whipping him with a stick. He got up weakly. I brought him more grass; he ate anything, biting off even the tops of sticks. I walked him about. My father hunted around and finally spied our other four horses in a bunch in the hills to the north.

When I had tunneled through the snow my dog met me at the mouth of the tunnel. While we were still in the tent, my father and I heard a noise overhead which we thought made by a ghost, but it was only my dog on the snowdrift above us.

We remained at this spot the rest of that day and through the night, digging the tunnel out to the ground, to reach our tent. We cut the



Fig. 127. An Improvised Cap worn as Protection against Snow.

sinews used to sew the tent skins together and in this way removed the cover, piece by piece. We abandoned the poles.

*The Return Trip.* We set out on our return trip the next day, loading our meat on two of our horses. Our fast horse, the gray, we did not load. We never put a heavy burden on a race horse or hunter, for fear of injuring its speed. Of meat fit for drying, we Indians reckoned there were twelve pieces or cuts to a side. A cow could be loaded on a pony, even with a few more pieces added. We divided our meat between two horses to make the loads lighter. However, we packed some firewood on the top of each load, since we knew we could get no more fuel until we reached the Missouri.

The snow was very deep so that we had to stop and camp after we had proceeded about a mile. The following day was quite warm, so we made our way along the tops of hills and rising ground, for the coulées were filled deep with drifted snow. Even then, we often found it necessary to dig a trail through the snow with our hoe. However, as the day wore on, the snow melted, filling the coulées with water, making it more and more difficult to travel. Finally, about sunset, we reached our village, footsore and weary.

*The Feast.* All our relations now came into our lodge, and my mother cut off pieces of the meat we brought and gave some to each. At that time there were four white men living in the village who had married into our tribe. One was named, Mr. Pákinaw;<sup>1</sup> another was Mr. Smith's father; a third, was named Pete Bóshan; a fourth was named Malóly. These men were of the people our folk call the Big Knives. They said "sacre-e-e" whenever they got angry.

My father called these four white men to his lodge. My mother had boiled a good part of the buffalo meat and my father gave a portion to each of the white men, much more in fact than they were able to eat. What they could not eat, they took home with them. We did not like to have any one to whom we had given food, fail to eat it, or at least take the uneaten portion home. If our gift or any part of it was left we said, "He does not like it!" and it made us feel bad.

In those days we did not use much coffee, but drank the broth our meat was boiled in for a hot drink. We had learned what coffee was and we were fond of it; but it was very hard to get and what little was brought into the village, the traders usually kept for themselves.

---

<sup>1</sup>Spelling of names is phonetic, after Wolf-chief's pronunciation.—G. L. W.

One of the four white men was a trader. They left the lodge as I have said, taking their uneaten meat with them; but they soon returned, each with a present of a little package of coffee done up in a cloth, and a bit of sugar, also in a cloth.

The coffee was green. We parched some of it that same day. When parched we put it in a corn mortar and pounded it fine and boiled it in a copper kettle. Later we got kettles of brass, and after them kettles of iron.

We drank the boiled coffee liquor with the sugar. The grounds that were left we dried carefully, parched them in a pan a second time, and boiled them again. This second boiling tasted almost as good as the first. ¶ We did thus because coffee was then so hard to get, and so expensive.





512

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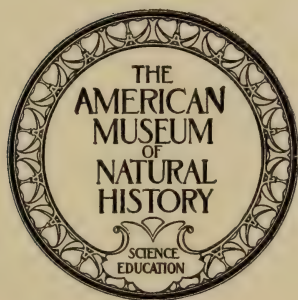
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THE MUSICAL INSTRUMENTS OF THE INCA

BY

CHARLES W. MEAD



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#### AUTHOR'S NOTE

Most of the text in this paper appeared under the present title in 1903, as a Guide Leaflet, supplementary to the American Museum Journal. At that time no one had given the subject much attention, and, though a number of musical instruments were to be found in museum collections, absolutely nothing was known concerning the music of the ancient Peruvians. However, during the twenty or more years that have passed, additional instruments have been discovered and several competent investigations made into the character of the ancient music itself as found still surviving in Peru and Bolivia. In all, a large number of songs has been collected from the Indians of the Sierras, quite a number of which are in the pentatonic, or five-toned scale, which is generally regarded as the first stage in real musical development. All these studies and the new material they have brought to light, made it possible to add new matter and thus make what is, in the main, a new paper.

Charles W. Mead.

June, 1924





## CONTENTS

|                                      | PAGE. |
|--------------------------------------|-------|
| INTRODUCTION.....                    | 319   |
| INSTRUMENTS OF PERCUSSION.....       | 321   |
| Drums.....                           | 321   |
| Bells.....                           | 321   |
| Rattle and Cymbal.....               | 322   |
| WIND INSTRUMENTS.....                | 323   |
| Syrinx or Panpipe.....               | 323   |
| Panpipes and Culture Connection..... | 332   |
| Flute.....                           | 335   |
| Resonator Whistle.....               | 340   |
| Trumpet.....                         | 341   |
| Double Whistling Jar.....            | 343   |
| STRINGED INSTRUMENTS.....            | 345   |
| CONCLUSION.....                      | 346   |

## LIST OF ILLUSTRATIONS

### PLATES

- V. Decorations from Ancient Peruvian Terra Cotta Vessels showing Musical Instruments in Use.
- VI. Musical Instruments: Drums, Rattles, Bells and Cymbals.
- VII. Musical Instruments: Trumpets and Rattles of Shell and a Syrinx.
- VIII. Musical Instruments: Whistles, Panpipes, Syrinx, and Trumpet.
- IX. Types of Peruvian Flutes.

### TEXT FIGURES

|   | PAGE. |
|---|-------|
| 1. Prehistoric Panpipe from Grave in Ica, Peru . . . . .  | 327   |
| 2. a, Section of the Cane of one Reed in the Panpipe shown in Fig. 1; Upper<br>End of a Reed in the Panpipe shown in Fig. 1. . . . .          | 329   |
| 3. Terra Cotta Panpipe from Grave in Nazca, Peru. Courtesy of the Mu-<br>seum of the American Indian, Heye Foundation . . . . .               | 331   |
| 4. Terra Cotta Panpipe from Grave in Nazca, Peru. Courtesy of the Mu-<br>seum of the American Indian, Heye Foundation . . . . .               | 332   |
| 5. Bone Flutes . . . . .  | 336   |
| 6. Terra Cotta Flute from a Prehistoric Grave at Ica, Peru . . . . .  | 340   |
| 7. Gold Ornament from Trujillo, Peru . . . . .  | 341   |
| 8. Blowing a Shell Trumpet in Prehistoric Mexico. From a pictorial manu-<br>script in the Florentine Biblioteca Nazionale, Folio 23 . . . . . | 342   |





## INTRODUCTION

Ancient Peru, the land of the Inca, extended, according to the historians, Garcilasso de la Vega<sup>1</sup> and Prescott,<sup>2</sup> from about the second degree of north latitude to the Maule River in Chile, about the thirty-sixth degree of south latitude. The country included the region now comprised within the Republic of Peru, and the greater part of Ecuador, Bolivia, and northern Chile, and was nearly equal in size to that part of the United States east of the Rocky Mountains. The Inca had no written language, and no small part of our knowledge of their customs has been derived from their practice of representing the scenes of daily life in the decoration of their pottery vessels. In the study of the musical instruments, in particular, the decorations on the pottery of the ancient Peruvians is important, because the Spanish conquerors and their followers have left in their accounts but little information bearing upon the subject. From the pottery and other objects found in the ancient tombs and burial places, therefore, we have derived most of our knowledge of the musical instruments of the Inca. The present discussion is based upon a study of the prehistoric Peruvian collections in the American Museum of Natural History. In these collections are not only many of the musical instruments themselves, but also artifacts, principally pottery vessels, decorated with figures of men in the act of playing upon such instruments.

It is commonly said that "Peru is a puzzle"; certainly this may be truthfully said of its music. Although we find recorded a number of characteristic songs, known to the Peruvian Indians for nearly two hundred years, we cannot say positively of any one of them that it is wholly pre-Spanish. Dr. von Tschudi has published three Peruvian elegiac songs or *haravis*<sup>3</sup> which he says "might serve to test the musical knowledge of the ancient Peruvians," but an examination of these pieces is very disappointing. Carl Engel remarks:—

At all events they must have been tampered with, as they exhibit exactly the form of the Spanish *bolero*. Even allowing that the melodies of these compositions have been derived from Peruvian *haravis*, it is impossible to determine with any degree of certainty how much in them has been retained of the original tunes, and how much has been supplied besides the harmony, which is entirely an addition of the European arranger.<sup>4</sup>

The first and simplest element of music is rhythm, and in singing or dancing, a desire for some sound that shall clearly mark it, is universal; hence, in the absence of musical instruments, the custom of snapping the

<sup>1</sup>*Royal Commentaries of Peru*. Ed. Rycaut, Part I, Book, I, Chap. III.

<sup>2</sup>Prescott, William H., *History of the Conquest of Peru*, vol. 1, 28.

<sup>3</sup>Tschudi, Juan Diego y Rivero, Mariano E., *Antigüedades Peruanas*, (Vienna, 1851), 135, 136.

<sup>4</sup>*Musical Instruments*, 79.

fingers, clapping the hands, beating the hips and stamping the feet; and I am inclined to follow Rowbotham<sup>1</sup> in believing that the art of instrumental music in prehistoric times passed through three stages, which may be designated the "drum", the "pipe", and the "lyre" type. The first type includes all instruments of percussion, as drums, rattles, gongs, castanets, etc.; the second, all wind instruments; and the third, all stringed instruments. In support of this theory he cites the evidence furnished by the mechanical complexity of the instruments themselves. The drum is the simplest form; the pipe is more complex than the drum; and the lyre, which makes use of stretched strings, is the most complex of all.

That the drum was the first instrument of primitive man is strenuously opposed by Wallaschek, who says:—

The most ancient discoveries (from the youth of mankind) of flutes and pipes, but not of drums, are definite facts which no speculation can put aside, and I am rather inclined to believe that Wagener was correct in saying that a wind instrument was undoubtedly the first.<sup>2</sup>

The entire absence of drums and the large number of flutes in the prehistoric Peruvian collections in museums would seem to support this claim in Peru were it not for the fact that numerous pottery vessels decorated with figures in the act of beating the drum are found with mummies in the ancient graves. (See Plate V).

The fact that a tribe has flutes and no drums is not proof that its earliest instrument was not the drum for there are well-known cases of the "dropping out" of musical instruments. In Guatemala the *marimba* has become a national instrument. Professor O. T. Mason, referring to this instrument, says:—

In one case we have a musical instrument imported by negro slaves given to the Indians with its native African name and abandoned by the negroes themselves.<sup>3</sup>

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<sup>1</sup>Rowbotham, J. F., "Art of Music in Prehistoric Times" (*Journal, Anthropological Institute of Great Britain and Ireland*, vol. 10, 380-388, London, 1881).

<sup>2</sup>Wallaschek, Richard, *Primitive Music. An Inquiry into the Origin and Development of Music, Songs, Instruments, Dances, and Pantomimes of Savage Races*. London, 1893.

<sup>3</sup>Mason, Otis T., "Geographical Distribution of the Musical Bow" (*American Anthropologist*, vol. 10, 377-380, 1897).

## INSTRUMENTS OF PERCUSSION

In instruments of this class the drum undoubtedly held the first place, although, as has been stated, none has been found in the ancient graves up to the present time. This may be accounted for by the perishable material of which they were made; or, through the existence of some superstition on account of which they may never have been buried with the dead. However this may be, the numerous representations on pottery vessels, and the accounts of early writers, give us a fairly accurate idea of their form and construction.

*Drums.* The drums appear to be identical with those in use in many parts of Peru today and were made by stretching a skin over a hoop of wood or over one end of a short section of the trunk of a tree which had been hollowed out to a thin cylinder. These two forms of drum are shown on Plate VI, where two men (Figs. 7 and 10) are beating very thin drums, which seem to represent the hoop form, while another drummer (Fig. 9) plays upon one much thicker, which is probably of the second type. Judging from these representations, the drums would not exceed fourteen or fifteen inches in diameter. We are told frequently by early writers that small drums were used on different occasions; but no mention of larger ones, so common in many Indian tribes, has been found. The Abbé Molina, describing the method of curing the sick, says:—

The *Machi* directs the women who are present to sing with a loud voice a doleful song, accompanied with the sound of some little drums, which they beat at the same time.<sup>1</sup>

Doubtless the heads of these drums were usually made of the skin of the deer and other animals common to the country, but this was not always the case. The Huancas “flayed the captives they took in war, making some of the skins into drums.”<sup>2</sup> Garcilasso says:—

They were a sort of fierce and warlike people fleaing those whom they took in the wars, the skins of which they filled with ashes and hanged them up in the temples for trophies; with the skins of some they make drums, being of opinion that the sound of them would terrify their enemies.<sup>3</sup>

*Bells.* Copper bells, in form resembling our sleigh bells, appear to have been in common use. Figs. 2, 3, and 4 of Plate VI show three, each of which has a pebble in the cavity. Fig. 1 shows a flattened form, decorated on either side with a figure, probably representing the sun. This

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<sup>1</sup>Molina, Abbe Don J. Ignacius, *The Geographical, Natural and Civil History of Chili* (Middletown, 1808), 92.

<sup>2</sup>Cieza de Leon, Pedro de, “Travels of Cieza de Leon, A.D. 1532–50, contained in the First Part of his *Chronicles of Peru*” (*Hakluyt Edition, translated and edited by Sir Clements Markham, London, 1864*), 299.

<sup>3</sup>*Royal Commentaries of Peru*, Part 1, Book 6, Chap. 10.



bell has been broken, and the pebble or "clapper" is missing. Cieza de Leon, who is perhaps the most reliable of the contemporaneous writers, remarks:—

When the chiefs [Guayaquil, Ecuador] were sick, to appease the wrath of their gods, and pray for health, they made other sacrifices of a superstitious nature; killing men (as I was told), and believing that human blood was a grateful offering. In doing these things they sounded drums and bells before certain idols shaped like lions and tigers, which they worshipped.<sup>1</sup>

In the Museum collection there are three bronze objects, circular in outline and slightly concavo-convex, each having a projection perforated for suspension. When struck with any hard substance, they give out a remarkably clear and resonant sound. One of these is shown as Plate VI, Fig. 12. It is three and seven-eighths inches in diameter. Ewbank, describing Señor Barboza's collection of Peruvian antiquities, figures three of these objects, two of which he states are of copper and one of bronze. He says: "I took them for mirrors; but they do not seem to have been polished."<sup>2</sup> None of the three in the Museum shows any indication, on either side, of having been polished, and there seems to be no reason to doubt that they were used as gongs or bells.

*Rattle and Cymbal.* Of the various forms of rattles it is hardly necessary to speak in detail. They consisted of small shells and nuts, seeds of a species of laurel tree, etc., and were often strung together. (See Plate VI, Fig. 8 and Plate VII, Figs. 5, 7, 8.) These were attached to the wrists, ankles, and other parts of the body in dancing. A common form of rattle was a gourd containing seeds or pebbles. The use of shells as paint cups or palettes was very common, as is attested by numerous specimens which still contain paint found in graves; but their use as musical instruments in ancient Peru, has not been noticed before. Figs. 5 and 6 of Plate VI, represent water vessels of terra cotta, decorated with figures striking shells together, as cymbals are played. The "cymbals" are so well modeled that there can be no doubt that they represent *Spondylus* (*Spondylus pictorum*, Chem.) shells. (Plate VI, Fig. 11.)

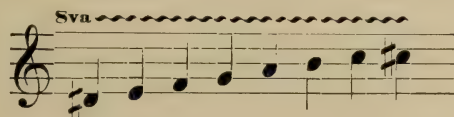
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<sup>1</sup>*Travels of Cieza de Leon*, 203.

<sup>2</sup>Ewbank, Thomas, *Life in Brazil; or a Journal of a Visit to the Land of the Cocoa and the Palm* (New York, 1856), Appendix, 454.

## WIND INSTRUMENTS

*Syrinx or Panpipe.* Long before the Conquest the Peruvians had emerged from the first or drum stage, and reached the second, which C. K. Wead defines as that "having instruments mechanically capable of furnishing a scale"<sup>1</sup>—a tremendous stride in the art. The most important instruments of this class are the syrxinx or panpipe (*huayra puhura*) and the flutes of bone and cane. Plate VIII, Fig. 7 shows a syrxinx consisting of eight reeds of graduated lengths, held in position by a crosspiece of split cane lashed to the reeds with a cord made of the wool of the llama. This pipe has all the reeds open at the lower ends, and yields the following scale:—



Other panpipes are found with reeds closed at the lower end; and still another form has a double set of the same dimensions,—one set open at the bottom and the other closed, those of corresponding length being placed opposite each other. By this arrangement octaves are produced, the closing of a pipe at one end, as is well known, lowers its pitch an octave. This same law is utilized by the modern organ builder in the employment of the so-called open and stopped diapasons.

Two panpipes that are complementary, one furnishing the notes that are lacking in the other, are in common use today in parts of South America, particularly in Bolivia. They are connected by a long cord and the two performers must sound a note alternately in order to produce a scale. The Inca had these pipes, as they represented them on their pottery vessels.

A curious and unique syrxinx of stone is shown as Plate VII, Fig. 3. The illustration is made from a plaster cast. The original, which was procured by the French general, Paroissien, is made of greenish talc, and is said to have been found on a mummy in a Peruvian tomb. This interesting specimen has been described at length by Carl Engel.<sup>2</sup> Plate VIII, Figs. 1 and 2 represent water jars, in human form, made of terra cotta; both figures are represented in the act of playing the panpipes. Garcilasso says:—

<sup>1</sup>Wead, C. K., "Contributions to the History of Musical Scales" (*Report, United States National Museum for 1900*, pp. 417-462, Washington, 1902), 421.

<sup>2</sup>*Musical Instruments*, 66.

In music they arrived to a certain harmony, in which the Indians of Colla did more particularly excel, having been the inventors of a certain pipe made of canes glued together, every one of which having a different note of higher and lower, in the manner of organs, made a pleasing music by the dissonancy of sounds: treble, tenor and bass, exactly corresponding and answering each to other; with these pipes they often played in consort, and made tolerable music, though they wanted the quavers, semiquavers, airs, and many voices which perfect the harmony amongst us.<sup>1</sup>

These pipes are as popular with the modern Indians as they were with their ancestors in the days of the Inca. Indian couriers frequently use this instrument to announce their arrival and departure, as the post-horn was used by the driver or guard of a mail coach in England, and as it was by a New York coaching party.

E. G. Squier, who witnessed the *chuño* or potato festival of the Aymará Indians, says:—

Each group danced vigorously to its united music, which made up in volume what it lacked in melody—wild and piercing, yet lugubrious: the shrill pipe [panpipe] and the dull drum, with frequent blasts on cow's horns by amateurs among the spectators, filled the ear with discordant sounds. Every man seemed anxious to excel his neighbor in the energy of his movements, which were often extravagant; but the motions of the women were slow and stately. The music had its cadences, and its emphatic parts were marked by corresponding emphatic movements in the dance. The 'devilish music' that Cortez heard after his first repulse before Mexico, lasting the livelong night, and which curdled his blood with horror, while his captured companions were sacrificed to Huitzilpochtli, the Aztec wargod, could not be stranger or more fascinating, more weird or savage, than that which rung in our ears during the rest of our stay in Tiahuanaco.<sup>2</sup>

Lieut. Gibbon describes the "church performances" of the Aymará Indians thus:—

The wind-instruments are made of a succession of reeds of different sizes and lengths [panpipes], upon which they blow a noise, little resembling music to our ear, keeping time with the drummers, the slow-motioed dancers respecting them both. . . . The women again appeared, each bringing with her a jar of *chicha*, which they served out in cups, giving to each individual as much as he could drink, which was no small quantity, for the morning was cold. The music again struck up, and the women again joined in the dance. One of them came out with her sleeping 'wawa' slung to her back, which soon commenced a laughable discord; but not a smile could be discovered in any of their faces; neither did the woman stop till the dance was ended.<sup>3</sup>

Bearing this description in mind, it will be interesting to turn to Plate V, Fig. 2, which represents figures of men and women in relief, forming a band around a pottery water vessel. There is every reason to

<sup>1</sup>*Royal Commentaries of Peru*, Ed. Rycaut, Part I, Book II, Chap. XIV.

<sup>2</sup>*Travel and Exploration in the Land of the Incas*, 306, 307.

<sup>3</sup>Gibbon, Lardner, and Herndon, W. L., *Exploration of the Valley of the Amazon* (Washington, 1854), 117, 118.



believe that the potter who moulded these figures was gathered to his fathers long before the coming of the Spaniards, yet he depicts the identical scene described by Lieut. Gibbon after so great a lapse of time, showing how such customs persist with these Indians. The musicians play upon panpipes and the drum. The woman with her "wawa" (baby) strapped to her back is here, nor are the jars of *chicha* wanting. *Chicha* is a fermented drink made of maize, and is still the national drink of the Indians. J. Skinner relates that,

In alternation of dancing, singing, and drinking they remain for several days and nights without intermission, until all the jars are empty. Father Figueroa pleasantly observes that he is at a loss to conjecture how they have a head for so much noise, a throat for so much exclamation, and a tooth for so much liquor.<sup>1</sup>

Since the rustic god, Pan, played upon his pipe in Arcadia, his invention has been the most highly developed musical instrument among hundreds of barbarous and semi-civilized peoples. It was in use in South America before Columbus, where it was found from the Isthmus of Panama to central Chile. It is doubtful if the panpipe was used in North America in prehistoric times. The double whistle, blown in the same way, appears to have been the nearest approach to it. The very early use of the panpipe in South America precludes the idea that it was an importation from the Old World, and stamps it as an independent invention of the Indians of that continent.

The instrument is familiar to us under the names of panpipe, pan-flute, syrinx, and mouth organ. It is undoubtedly the precursor of our great modern organs; we find it mentioned in the Old Testament (Gen. IV, 26) where it is called organ. In its most common form it consists of a number of reeds of graduated lengths, fastened together either by cords or splints of cane, or by both splints and cords. The upper ends form a horizontal line and the lower a series of steps. Generally, the reeds are cut off below the nodes which make them closed or stopped pipes. The quality of a stopped pipe is reedy and veiled because of the absence of harmonics of even numbers. The wave must traverse the length of the tube twice as it is reflected by the closed end. The result is that another node is set up at one-third of the length from the upper end, the second harmonic at one-fifth of the length, thus dividing the lower four-fifths into two equal parts. In the open reed the first harmonic is the octave of the fundamental tone; in the closed reed it is the twelfth. Sometimes these instruments are made with two rows of reeds in which case the reeds

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<sup>1</sup>Skinner, Joseph (Ed.), *The Present State of Peru: comprising its Geography, Topography, Natural History, Mineralogy, Commerce, the Customs and Manners of its Inhabitants, etc.* London, 1805. (290).



in the second row are open throughout their length and are generally so arranged that each closed pipe has an open one opposite to it that gives the octave.

Two panpipes fastened together by a long cord and played by two performers are very common in Bolivia today. Each instrument has but half the notes of the scale, every other one being absent, and these must be given by the man playing the complementary pipe.

Panpipes are usually made of some kind of cane or reed, but occasionally of wood, metal, stone, and terra cotta.

Mr. Safford encountered at Puno, on Lake Titicaca, an orchestra composed entirely of panpipes. He says:—

The performers, who were full-blooded Quichua Indians, sounded the pipes by blowing across the opening of the inner or closed reeds, the corresponding outer open reeds apparently serving the purpose only of giving volume or quality to the note sounded.<sup>1</sup>

These instruments heard by Mr. Safford were tuned to our scale and he states that this orchestra played the national air of Peru in a creditable manner.

Erland Nordenskiöld says:—

When studying Indian musical instruments we must bear in mind that, in post-Columbian times, they have learned a good deal from the Whites and negroes.

At the mission stations the Indians are always instructed by the missionaries in music. At the Bolivian mission-stations it is not unusual to come across Indians who very well understand musical notation, though unable to read or write. At the Chiriguano mission stations there are full-blown musical bands.<sup>2</sup>

In the Montero collection from prehistoric graves at Ica, Peru, the American Museum has a panpipe which has some remarkable peculiarities in its construction (See Fig. 1). It has fourteen reeds in two rows; one row with reeds open throughout their length; the other, closed at the lower end. The closed reeds are not stopped by a node of the cane, but by a piece of gourd so nicely cut and fitted as to be airtight. This is the first time I have seen the reeds of a prehistoric panpipe so closed.

There is still a greater peculiarity at the upper ends of the open pipes. The reed was not cut off below the node, but through it, in such a way as to leave some of it partly closing the bore. A notch was then cut into the rim of the cane, and something in the nature of a punch used in this notch to force some of the substance of the cane through into the bore in the form of a small sharp point. Fig. 2a shows a section of the cane and Fig. 2b the upper end of one as it is in this instrument.

<sup>1</sup>Safford W. E., Panpipes (*Journal, Washington Academy of Sciences*, vol. 4, no. 8, 1914).

<sup>2</sup>Nordenskiöld, Erland, "The Changes in the Material Culture of Two Indian Tribes under the Influence of New Surroundings" (*Comparative Ethnographical Studies*, No. 2, Goteberg, 1920), 116.



Fig. 1 (41.0-1626). Prehistoric Panpipe from Grave in Ica, Peru.



Such reeds do not give out a full volume of tone, but are shrill, like the sound produced by blowing across a small key. They could never have been used in conjunction with the closed reeds, as aside from the difference in volume and quality they do not give the octave of the shorter closed reed, with which they are paired.

Carl Ribbe describing some musical instruments of the Solomon Islanders says:—

The best perfected instruments are the so-called Pan-pipes having two rows of reeds. These are not of the kind where the reeds are played upon that lay against the mouth, the breath being blown over them into the outer row.<sup>1</sup>

Considering what Safford and Ribbe have said, are we warranted in assuming that the set of open reeds in our Ica pipe was perfectly useless, for I cannot see how such reeds can act as resonators?

It does not seem probable that so much work and ingenuity would have been expended in fashioning pipes in so peculiar a manner if they were not expected to play some part in the music produced; but it is useless to try to fathom the workings of the primitive mind. Still another odd feature of this panpipe is that the longest open reed is three times the diameter of all the others.

It is not possible to give an absolutely correct scale for a set of reeds that has been buried in the ground for perhaps a thousand years, as the cylinders are no longer true; some are badly cracked, and all are more or less injured. When I say scale, in connection with prehistoric Peruvian musical instruments, I use the word with considerable mental protest. Scale implies a regular fixed succession of intervals. Of course, I do not expect a primitive man to make two flutes or two panpipes exactly alike; but I have never yet found two near enough alike to lead me to believe that this had been attempted.

Following are the theoretical vibration numbers of the seven closed reeds of this Ica panpipe, as determined by the length of the air columns, found by measuring the length of the reeds inside:—

|         |        |
|---------|--------|
| 1137.93 | 755.25 |
| 1080.30 | 651.57 |
| 958.92  | 566.73 |
| 872.80  |        |

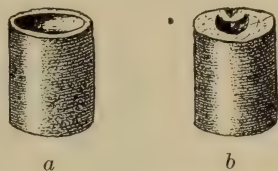


Fig. 2. *a*, Section of the Cane of one Reed in the Pan-pipe shown in Fig. 1; *b*, Upper End of a Reed in the Panpipe in Fig. 1.

<sup>1</sup>Ribbe, Carl, *Zwei Jahre unter den Kannibalen der Salomo-Inseln* (Dresden, 1903), 135.



In sounding the different notes of such an instrument, we seldom find a single one that is exactly, in pitch, like any one in our diatonic scale. All that can be done in such a case is to give it the name of the note that it most nearly approximates. In this case they may be written: —D—B—B<sup>b</sup>—G—F—E<sup>b</sup>—D. This is in as close agreement with the theoretical vibration numbers as can be expected.

The Museum has a panpipe from a grave in Arica, Chile. The reeds were all formerly stopped by nodes which have been mostly broken out. Reckoning from the inside measurements of the canes the vibration numbers are:—

|        |        |
|--------|--------|
| 666.75 | 406.40 |
| 576.68 | 372.23 |
| 513.96 | 333.37 |
| 458.83 | 333.37 |

This pipe is peculiar in that the two longest reeds are of exactly the same length.

There are four panpipes from New Guinea in the Museum's collections. One has four canes, the others only three. The canes are held in place by cords near the top and bottom. In one case the cord is made of human hair; in the others, of some vegetable fiber. All are closed near the lower end by the node of the cane. Two of these pipes give the following vibration numbers:—

|        |        |
|--------|--------|
| 402.56 | 632.16 |
| 414.29 | 457.54 |
| 379.30 | 520.63 |
|        | 592.66 |

The first pipe has its shortest reed in the center, while in the other we find the shortest on the left, followed by its longest. The vibration numbers seem to show that no attempt was made to tune these pipes to any scale. If any crude approach to an air was played on one of them, it could not be duplicated on the other.

Figs. 3 and 4 show two panpipes in terra cotta. They are part of the Eleodora Pachas collection from prehistoric graves in Nazca, Peru. This valuable collection which contains some four hundred pottery objects is now the property of the Museum of the American Indian, Heye Foundation, whose authorities have kindly loaned me these panpipes for study and publication.

The larger of the two measures 28.5 cm. on the side of its longest "reed", the smaller, 14.5 cm. Both instruments have ten tubes with

openings at the upper end in the form of an ellipse; but on looking into them they are seen to be otherwise perfectly cylindrical. They appear to have been made by introducing a cylindrical piece of wood or a section of cane while the clay was plastic, and pressing the material to this core. After this was withdrawn the opening was pressed out round.

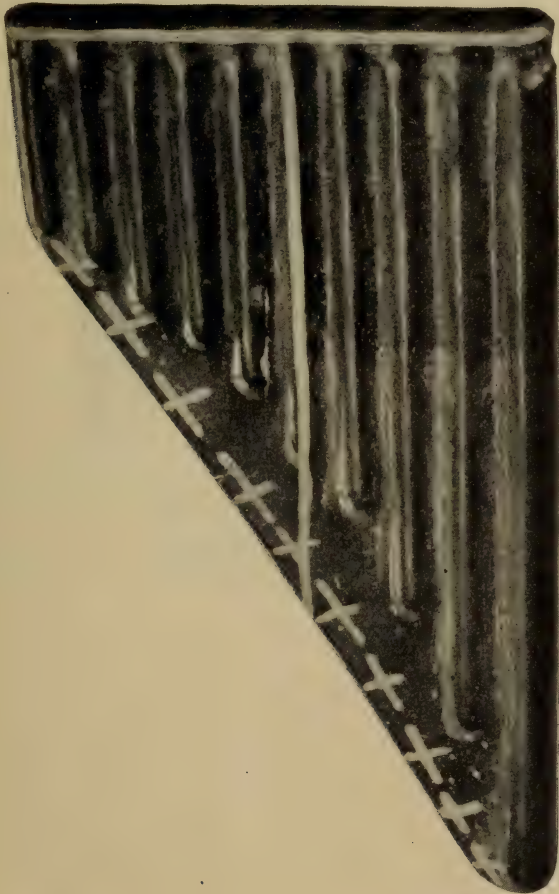


Fig. 3. Terra Cotta Panpipe from Grave in Nazca, Peru.  
Courtesy of Museum of the American Indian, Heye Foundation.

These pipes sound very freely, giving forth a loud, penetrating tone, somewhat metallic in quality. Both are painted in two colors, dark gray or chocolate color and bright red. Each of these colors covers about half of their surface and is separated by a line of white. Chocolate color

and red are not differentiated in a photograph, but the white line running lengthwise, shows the division between the two colors. Both are decorated with white crosses. Below are the vibration numbers of the tubes

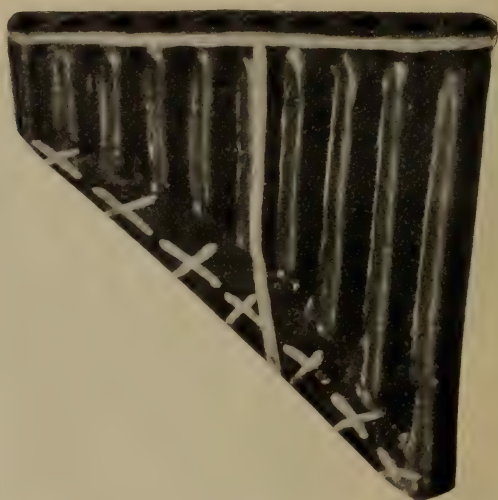


Fig. 4. Terra Cotta Panpipe from Grave in Nazca, Peru.  
Courtesy of Museum of the American Indian, Heye Foundation.

in these instruments. The column at the left is for the larger panpipe, the one at the right for the smaller panpipe.

|         |         |
|---------|---------|
| 310.59  | 613.39  |
| 372.71  | 779.32  |
| 476.25  | 592.50  |
| 585.01  | 1174.32 |
| 649.43  | 1318.84 |
| 793.75  | 1558.64 |
| 902.36  | 1824.46 |
| 1008.52 | 1993.60 |
| 1207.74 | 2449.28 |
| 1382.66 | 2857.50 |

*Panpipes and Culture Connection.* The highly advanced state reached in several of the arts in parts of America before the discovery by Columbus has naturally led many to the belief that at some remote time there had been communication between the peoples of the Old and the New World.

First and last almost every eastern country has for a time done duty as the source of this or that thing found in America. When any American form has been found to be similar to that in any distant land (for example, Dr. Graebner's claim in connection with crutch-paddles)<sup>1</sup> cultural connection has often been seen, little consideration being given to the possibility of independent invention.

Of late years several anthropologists have turned their attention to the South Sea Islands, believing that they have discovered convincing evidence of cultural connection between their peoples and those in parts of South America. As the most striking argument in support of this theory deals with the old Inca musical instrument, the panpipe, I shall give its claims with comments.

In his paper entitled: "Ueber ein akustisches Kriterium für Kulturzusammenhänge"<sup>2</sup> Dr. Erich von Hornbostel believes he has produced indisputable evidence of culture connection between the peoples of the South Sea and Northwest Brazil, by means of similarities in their panpipes.

Although Dr. von Hornbostel's claim has been endorsed by some ethnologists I have seen no reason to change the opinion I formed of it when the article appeared: that it was a remarkably good and painstaking piece of work, and convincing, if further tests gave the same results as he had undoubtedly obtained, which, however, seemed to me could not possibly be the case.

For a better understanding of what follows I give here his opening sentences:—

If one surveys the manifold forms of the Panpipe and its distribution over the world one cannot overlook the fact that the type having double rows—that have opposite each closed pipe an open one (of about the same length) which gives the octave—is only found in two limited territories widely separated: in the Solomon Islands, and in western Polynesia (Fiji, Samoa) on one side, and Peru and Bolivia on the other. Even the characteristic ligature of the Solomon Islands—flat sticks with threads strung crosswise—is found in Peru and Brazil.

Here we are referred to this somewhat contradictory footnote:—

It is true that similar ones are found elsewhere, for instance in upper Egypt.

Dr. von Hornbostel's principal claim to a discovery of cultural connection between the peoples of Polynesia and of northwestern Brazil rests on a most peculiar musical scale which he believes common to the two localities. In a technical paper "Ueber einige Panpfeifen aus Nordwestbrasilien"<sup>3</sup> he describes this scale at length, calling the intervals a

<sup>1</sup>Graebner, F., "Krückenruder" (*Baessler-Archiv*, III, 1913), 191-204.

<sup>2</sup>*Zeitschrift für Ethnologie*, XLIII, 1911, 601-615.



circle of fourths (eine art Quatenzirkel). He says it is formed by the help of partial tones caused by over-blowing. His description of how an Indian may duplicate a panpipe will fully explain the nature of his scale.

The Indian may take the longest reed for measure and pitch. For the third reed he must cut one of a length that when overblown its first partial tone (a twelfth above the fundamental) will be identical with the double octave of the first reed. He is to proceed in the same way to cut his fifth reed by the third and so on with the odd numbered reeds. For the even numbers he begins by halving the interval between the first and third for the second reed, after which the other even numbers are made in the same way as the odd numbers.

Dr. von Hornbostel gives the following table of vibration numbers which he obtained from two panpipes, one from northwest Brazil, the other from the Solomon Islands; also the theoretical vibration numbers.

|                 | 1     | 2     | 3     | 4     | 5     | 6     |
|-----------------|-------|-------|-------|-------|-------|-------|
| Brazil          | 415.5 | 481.5 | 560.5 | 651   | 374.5 | 439.5 |
| Theoretical     | 415.5 | 481.6 | 559.6 | 650.4 | 378   | 439.2 |
| Solomon Islands | 415   | 473   | 557   | 651   | 379.3 | 440   |

Only the results he obtained from the first six reeds are given. Dr. von Hornbostel is a scientific, careful workman and I have not the least doubt as to the correctness of his vibration numbers although they are practically alike, wonderfully near when we consider that the reeds were cut by two primitive peoples so far separated, and that these panpipes were copies of others that had been made through the centuries. I can only see in these figures a very remarkable coincidence; otherwise, I must believe that two primitive peoples with no delicate standard instrument have retained, for many generations, an absolute pitch, a tone with just so many vibrations to the second, and have done this by some cutting instrument, wild reeds, and the human ear. I feel sure any manufacturer of wind instruments would declare this an impossibility.

Dr. von Hornbostel tells us that to prove cultural connection the panpipes must be similar in construction, have the same scale, and be practically alike in absolute pitch. Now the Solomon Islands pipes are made of two rows of reeds; one row with the lower ends closed, the other row open to give the octave. The Brazilian pipes have the reeds all in one row with the lower ends all closed. The manner of fastening the reeds together varies, but is often the same as in the Solomon Islands, which, however, is not peculiar to these two regions. Except for the liga-

<sup>1</sup>See Koch-Grünberg, Theodor, *Zwei Jahre unter den Indianern* (Berlin, 1909-10), Vol. 2, 378-391.

tures which keep the reeds in place it will be seen that they differ radically in construction.

I have lately examined fourteen panpipes from the Rio Caiary-Uaupés. It was on this river that Dr. Koch-Grünberg collected the Brazilian pipes studied by Dr. von Hornbostel. It was my intention in the beginning of this investigation to have determined the vibration numbers of these fourteen panpipes; but after working out two of them with the following results, and sounding the notes of the other twelve I found them to vary so greatly (no two very near together) that it seemed a waste of time and labor to continue. I met with no success in trying to find a uniformity in the pitch relationship of the reeds of the different instruments. In fact, the same scale (?) cannot be played on any two of them.

1122.94 870.80 661.05 508.00 396.94 306.90 249.55 193.09 141.00  
1040.78 870.85 735.72 584.55 488.02 367.64 296.45 245.37

*Flute.* On Plate IX, twenty-six flutes are represented. Nos. 1, 2 and 3 are of cane; Nos. 7, 8 and 9 are made from the wing bone (ulna) of the pelican; Nos. 11, 12, 14, 15 and 16 from combined ulna and radius of the llama; No. 13 is a small gourd. All the others are made from the ulnæ of deer. They are simply tubes, open throughout their length, and all belong to the class known as "end-blown."

In playing, the breath, crossing the opening at the upper end, impinges on the sharp edge, which is often notched, setting up vibration in the column of air within the instrument, thus producing the sound. It is a well-known law that the frequency of vibration, or, in other words, the pitch of a note produced, depends chiefly on the length of the column of air within the flute.

In the flutes represented the vents or holes for changing the length of the vibrating column of air vary in number from three to seven. In those made of cane they are all on the upper side, while the bone flutes often have one of the holes on the under side, which was closed by the thumb. Nos. 4, 5, 6, 10, 11, 14 and 17 to 26 are of the latter kind.

Many of the scales on pp. 338-339 are written an octave lower than those produced from the instruments. This brings them all within a reasonable compass and makes it much easier to compare their intervals. It must always be kept in mind that the written note is in many cases not the one given out by the instrument, but the one nearest to it in our diatonic scale.

All attempts to discover any rule or law governing the positions of the openings or vents have been unsuccessful. A first glance at several

of these flutes, particularly those made of cane, gives the impression that an attempt at equal spacing had been made; but a second shows such a variation in distances that this seems doubtful. The bone flutes (Plate IX, Figs. 25 and 26), are of the same length, yet a great difference in the position of the holes is apparent at a glance. We are led to the conclusion that these ancient flute-makers were not governed by set laws, but that each made his instrument according to his own idea. That the tones

produced are in false key-relationship is not to be wondered at when we consider the imperfections in their construction; in fact, the flutes are sadly out of tune. What the late John Comfort Fillmore wrote of the Omaha flageolet Indian may apply equally to these flutes:—

The imperfections are plainly due to the limitations, not of the Indian's perception, so much as of his scientific knowledge. The flageolet is evidently built "by guess," and only remotely approximates to the Indian voice in accuracy of intonation.<sup>1</sup>

Those acquainted with the difficulties that beset the maker of a flute at the present day will see nothing strange in the lack of method in the location of the vents in the flutes of these ancient Peruvians. Mr. Wead remarks:—

In practice these holes never can open so freely to the outside air that the portion of the tube beyond them may be considered as removed (the possibility or necessity of cross-fingering proves this to the player), so that the proper location and diameter of the holes to produce the notes of our scale of even quality are fixed, not



Fig. 5 (B-7946, 3846). Bone Flutes.

by a simple law, as the frets on the guitar are located, but by laborious experimenting to get a standard instrument which is then reproduced with Chinese fidelity.<sup>2</sup>

The question arises, were the intervals produced on these flutes satisfactory to the Indian? That the first attempt was not so in very many cases, we know from the indisputable evidence of his work. Fig. 4 of Plate IX, shows the under side of a flute. It will be seen that the original

<sup>1</sup>*Omaha Indian Music*, Alice C. Fletcher, Appendix, 73.

<sup>2</sup>Wead, *ibid.*, 426.

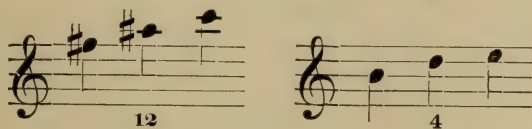


thumb hole has been closed (by a stopper made of gourd) and another perforated above it. No. 7 has had four of the six original holes plugged and others bored near them,—only traces of the gourd plugs remaining. No. 17 shows plainly the plug in the original hole, and the vent which was afterward made above it. No. 19 shows two sets of holes. Of the plugs, only traces remain; but the one in the under side (thumb hole) is still in as perfect condition as those to be seen in Figs. 17 and 21. In No. 20 they have entirely disappeared. The scales of the twenty-six flutes shown on Plate IX are given on pages 338 and 339. They have been carefully determined in conformity with the international pitch: vibration number  $a^1 = 435$ .

Many of the tones produced from these instruments only approximate, in pitch, to some one of the notes of our familiar twelve tone piano scale. In many instances the variation amounts to nearly a quarter of a tone. Considering the age and condition of these flutes, it is safe to say that in some cases the scales given here are incomplete, and this applies particularly to those made of cane.

No. 14 of this set appears much longer than it really is,—the bird figures being carved on a prolongation of one side of the bone, below the tube.

Nos. 4, 11 and 12, represented on Plate VIII, may be classed with the flutes. No. 12 is made from a shell (*Fasciolaria princeps*, Sowb.). It has two vents: one perforated through the top of the spire, the other in its side. No. 4 is an imitation of a shell in terra cotta. It is decorated with a human face and geometrical designs, which are not shown in the illustration. The scales of these flutes are given below:—

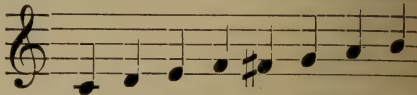


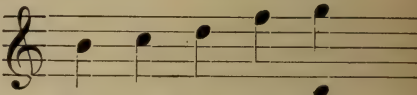
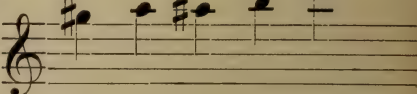
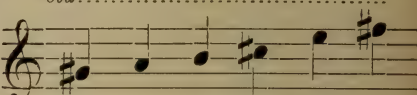
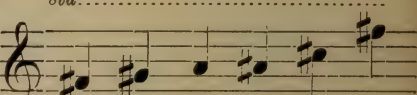
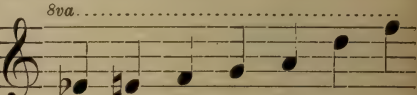

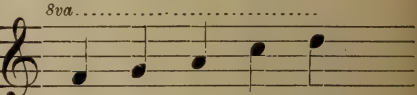
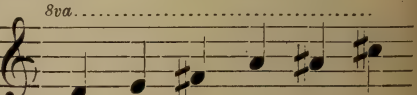
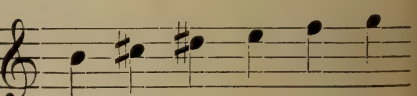


No. 11, also of terra cotta, is broken and the scale cannot be ascertained. These instruments are sounded by the breath impinging on the sharp edge of the outer lip of the shell.

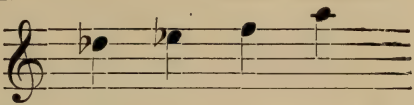

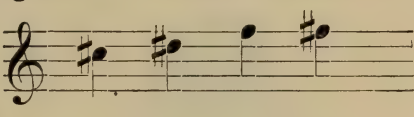
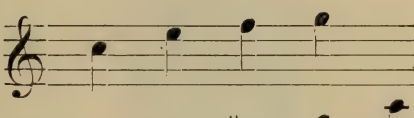
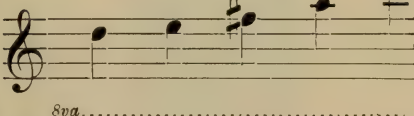
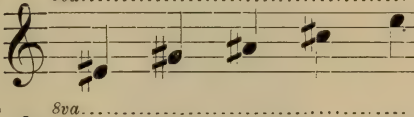
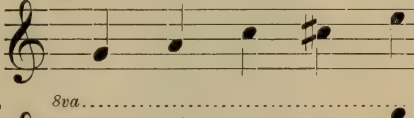
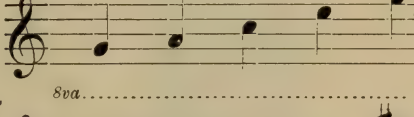
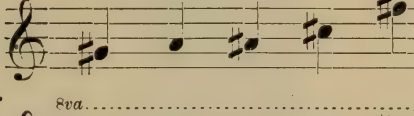
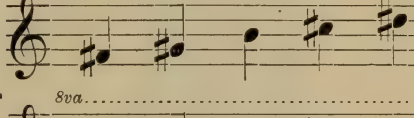
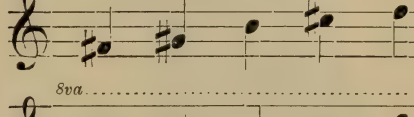
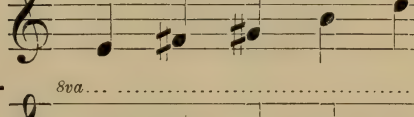
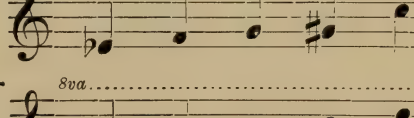
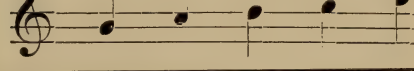
Fig. 6 shows a terra cotta flute from a prehistoric grave at Ica, Peru. It is a new style of flute to me, inasmuch as the lower end is turned up at a right angle to the body of the instrument. It is of the end blown type,  $8\frac{3}{4}$  inches long, and has five vents on the upper side, also one for the thumb on the under side, between the fourth and fifth vents above. Whether the opening in the turned up end, which looks



DESCRIPTIONS OF FLUTES REPRESENTED ON PLATE IX.

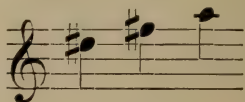
| Figure. | Museum No.        | Length in inches. | Scale.   |
|---------|-------------------|-------------------|--|
| 1       | $\frac{B}{3852}$  | $15\frac{13}{16}$ |                        |
| 2       | $\frac{B}{8139}$  | $10\frac{1}{8}$   |                        |
| 3       | $\frac{B}{8138}$  | $9\frac{7}{8}$    |                        |
| 4       | $\frac{B}{3509}$  | $3\frac{7}{16}$   |                        |
| 5       | $\frac{B}{382}$   | 4                 | <br><i>8va</i> .....   |
| 6       | $\frac{B}{505^B}$ | $4\frac{3}{8}$    | <br><i>8va</i> .....   |
| 7       | $\frac{B}{3848}$  | 5                 | <br><i>8va</i> .....   |
| 8       | $\frac{B}{3846}$  | $4\frac{9}{16}$   | <br><i>8va</i> .....  |
| 9       | $\frac{B}{3847}$  | $4\frac{9}{16}$   | <br><i>8va</i> ..... |
| 10      | $\frac{B}{618}$   | $6\frac{1}{4}$    | <br><i>8va</i> ..... |
| 11      | $\frac{B}{7945}$  | $5\frac{1}{4}$    | <br><i>8va</i> ..... |
| 12      | $\frac{B}{7951}$  | $7\frac{1}{8}$    |                      |

NOTE: The flute materials are: 1 to 3, cane; 13, gourd; the remainder, bone.

| Figure. | Museum No.         | Length in inches. | Scale.  |
|---------|--------------------|-------------------|---|
| 13      | $\frac{B}{8013}$   | 3                 |     |
| 14      | $\frac{B}{4929}$   | $6\frac{1}{8}$    |    |
| 15      | $\frac{B}{2648^A}$ | $6\frac{7}{8}$    |    |
| 16      | $\frac{B}{2648^B}$ | 8                 |    |
| 17      | $\frac{B}{7944}$   | $6\frac{3}{4}$    |    |
| 18      | $\frac{B}{7954}$   | 5                 |    |
| 19      | $\frac{B}{7955}$   | $4\frac{1}{2}$    |    |
| 20      | $\frac{B}{7948}$   | $4\frac{1}{4}$    |    |
| 21      | $\frac{B}{619}$    | 4                 |   |
| 22      | $\frac{B}{7949}$   | $5\frac{3}{8}$    |  |
| 23      | $\frac{B}{505^A}$  | $4\frac{5}{8}$    |  |
| 24      | $\frac{B}{7946}$   | 6                 |  |
| 25      | $\frac{B}{505^C}$  | $5\frac{1}{4}$    |  |
| 26      | $\frac{B}{750}$    | $5\frac{1}{4}$    |  |

like a vent, was stopped or not, there is no means of knowing. This makes it useless to attempt to determine its scale. The flute is of black ware and, as the photograph shows, is decorated with incised designs on the upper side, and has a puma figure near the upper end. This puma was moulded and attached to the instrument before firing. It is a powerful instrument and the tones, although so loud, are not disagreeable in quality.

*Resonator Whistle.* Whistles of the resonator class have a wide distribution and have been found in different sections of Peru. They are usually made of terra cotta, but sometimes of other materials. The kind most commonly met with emit but one or two tones and generally go by the name of signal whistles or bird-calls. The resonator type reached its highest form of development in Chiriqui and parts of Central America, where they commonly took the human form or that of some well-known animal or bird, and in most cases the grotesque element predominated in the representation. The openings (vents) to the air chamber in the body of these instruments vary in number, but seldom exceed four. Plate VIII, Fig. 13 shows an instrument of this class. This specimen is one and three-eighths inches high, and measures two and three-quarters inches from the nose to the tip of the tail. Its two vents are on the same side, yielding the following scale:—



No. 15, on the same plate, is of wood and has one vent. Its tones are:—



Fig. 6 (41.0-1625).  
Terra Cotta Flute from  
a Prehistoric Grave at  
Ica, Peru.

No. 6, on Plate VII, and Nos. 8, 10, and 14 on Plate VIII, are without vents and have but one note each.

Whymper, who gives an excellent account of the Incan remains in Ecuador, figures three of these whistles grotesquely resembling the human form. He has this to say of them:—

Then there are the musical pottery whistles, delightfully ugly things, which are sometimes more useful to carry than letters of introduction. Simple airs can be got out of them, and on the homeward journey my people lightened the way by playing on these primitive instruments.<sup>1</sup>



Fig. 7 (B-9585). Gold Ornament from Trujillo, Peru, showing Trumpets in Use.

*Trumpet.* The trumpet in its various forms is undoubtedly one of the most ancient of wind instruments and its distribution in prehistoric times was all but universal. Two forms of this instrument were common in Peru: the conch and a trumpet of terra cotta. Both of these forms are shown in Fig. 7.

This illustration shows the ornamentation on one side of a gold ornament found in a prehistoric grave at Trujillo, Peru. It is double-convex in form, consisting of two thin, concavo-convex pieces which are not joined by solder, as is sometimes the case in ornaments of this kind, but are held together by the edges of one of the pieces being turned tightly over the other. The figures are in *repoussé* work.

<sup>1</sup>Whymper, Edward, *Travels amongst the Great Andes of the Equator* (New York, 1892), 281.

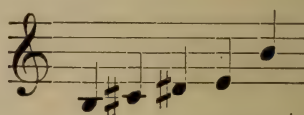


Plate VII, Fig. 1 represents a remarkably fine specimen of the shell trumpet. It has a copper mouthpiece, and is ornamented with an engraved figure of a warrior. The shell is a *Strombus galeatus*, Swains. Unfortunately the mouthpiece is so badly corroded that the scale of the instrument cannot be ascertained. Fig. 2, on the same plate, is of a

terra cotta trumpet and is one of several in the collection in which the shell form has been reproduced in clay. It would seem that this was frequently done when shells could not be obtained. This specimen is in perfect condition. Its scale is as follows:—



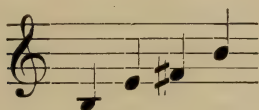
Fig. 8. Blowing a Shell Trumpet in Prehistoric Mexico. From a pictorial manuscript in the Florentine Biblioteca Nazionale, Folio 23.



The lowest or fundamental tone is produced on the open instrument; the next step above in the scale, by introducing the hand a short distance into the opening of the "shell." For the next higher note the hand is pushed still farther into the cavity, and so on until the highest tone of the instrument is reached. In the older natural or French horn, the so-called stopped tones are obtained in much the same way.

Fig. 8 shows that the shell trumpet was played in exactly this way in Mexico in prehistoric times. This illustration is from a Pictorial Manuscript in the Florentine Biblioteca Nazionale, Fol. 23. See Codex Vaticanus B, Seler, p. 162.

Plate VIII, Fig. 9 represents a clay trumpet similar to that represented on the gold ornament from Trujillo figured on page 341; the only difference is the shape of the "bell" which in the latter takes the form of an animal head. Besides its fundamental tone (B), only its octave can be produced. The other harmonics or overtones, on account of the material and its faulty construction, are absent. Nos. 5 and 6, on the same plate, are trumpets of wood. The mouthpieces are shallow and cup-shaped, as in No. 9, just described. No. 6 is badly cracked; but No. 5 is entire, and the following tones can be produced from it:—



The trumpet is frequently mentioned in the early accounts of Peru. Garcilasso, giving an account of the battle between the army of the Inca Viracocha and the Chanchas, says:—

Both armies remained the whole night upon their guard with sentinels set on each side; and in the morning, by break of day the squadrons arming themselves, with great noise and shouts, with sounds of trumpets, and timbrels, and cornets, they began the onset.<sup>1</sup>

Alonso de Ovalle remarks:—

The sound of the drum and trumpet is only to show them the necessity of their meeting in arms.<sup>2</sup>

Prescott tells us that at the siege of Cuzco (1536):—

The Spaniards were roused by the hideous clamor of conch, trumpet and atabal, mingled with fierce war-cries of the barbarians.<sup>3</sup>

Quite a number of instruments that have been described as trumpets are found in South America. Some of these are eight feet or more long. They are variously made of cane, bamboo, wood, and bark wound spirally. Many are true trumpets, either end or side blown, while others belong to the flute or flageolet class. A trumpet called *Juruparis* is found on the Uaupés River. It is always kept in a secret place and at the time of the celebration of a certain ceremony is brought out at night and sounded outside the *molocca*. Women may not look upon this trumpet on pain of death. A similar instrument is also found on the Orinoco. It does not appear that the Inca had any of these trumpets as none of them have been found in their graves, nor are they represented on their pottery vessels.

*Double Whistling Jar.* Plate VIII, Fig. 3 shows a double musical water bottle. It consists of two pottery vessels connected near the bottom in such a way that water passes freely from one to the other. Near the top of the first or front jar (usually surmounted by a human or some animal figure) is the opening of the whistle. When the jars have been partly filled and are swung backward and forward, a series of whistling sounds is produced. As the vessel swings forward and upward, the water is lowered in the first jar and raised in the other; in the backward motion it rushes back into the first, forcing the air out through the

<sup>1</sup>*Royal Commentaries of Peru*, Part I, Book V, Chap. XVIII.

<sup>2</sup>*An Historical Relation of Chile*, (John Pinkerton, ed., London, 1813), 122.

<sup>3</sup>*Conquest of Peru*, Vol. 2, 47.

whistle. It has often been said that the sound emitted by these jars resembles the cry of the animal represented on the vessel. A careful examination of eighty-five of these whistling jars leads to the conclusion that this is the result of a lively imagination—that they are whistles pure and simple.

Plate VII, Fig. 4 shows a nondescript instrument made of terra cotta. The tone is produced by blowing into either of the two holes in exactly the same manner that the trumpet is sounded. The lips, in both cases, act as reeds, causing the vibration of the air within the instrument.

## STRINGED INSTRUMENTS

A number of modern writers have stated that the *tinya*, a kind of guitar with five strings, was known to the Peruvians in pre-Spanish times. This seems as improbable as Ranking's story of fiddlers being attached to the court of Montezuma.<sup>1</sup> Garcilasso de la Vega, in his chapter entitled "Of the Geometry, Geography, Arithmetick and Musick known to the Indians," gives no account of any stringed instrument.<sup>2</sup> There is scarcely a chapter in the "*Cronica del Peru*" of Cieza de Leon that does not contain mention of some musical instrument, but we find no hint of instruments of this class. The Peruvians themselves, as we have seen, left behind them many of their instruments and numerous representations of them on their pottery vessels and metal ornaments; but among them all, not one belonging to the lyre type can be found. Professor O. T. Mason says:—

After looking over the musical collection of the United States National Museum and such literature as has been collected by the Bureau of American Ethnology, I have come to the conclusion that stringed musical instruments were not known to any of the aborigines of the Western Hemisphere before Columbus.<sup>3</sup>

Professor E. S. Morse agrees with Dr. Mason that there is no evidence of a pre-Columbian stringed device.<sup>4</sup>

I believe that no claim has as yet been made for the existence of the musical bow in Peru; and what Dr. Henry Balfour says of this most primitive of stringed instruments is very important, as showing with what caution the evidence should be considered before pronouncing any instrument to be of pre-Spanish origin:—

In viewing the various types of musical bow to be found in the New World, I must say that I feel that the case of the claims of this instrument to be regarded as indigenous (pre-Columbian) in the Americas can only as yet be dismissed with the verdict of *not proven*. I can find no absolutely convincing evidence to prove the case, and in view of the certainty of many varieties having been introduced by the immigrants from Africa, it will require very strong evidence to establish the claim.<sup>5</sup>

Although not conclusive, such evidence as we have at the present time is against the existence of any form of stringed instrument in Peru before the coming of the Spaniards.

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<sup>1</sup>Ranking, John, *Historical Researches on the Conquest of Peru, Mexico, Bogota, Natchez, and Talomeco in the Thirteenth Century, by the Mongols*, etc. (London, 1827), 344.

<sup>2</sup>*Royal Commentaries of Peru*, Part I, Book 2, Chap. 14.

<sup>3</sup>Mason, *ibid.*

<sup>4</sup>Appleton's *Popular Science Monthly*, March, 1899.

<sup>5</sup>*The Natural History of the Musical Bow* (Oxford, 1899), 50-51.



## CONCLUSION

Undoubtedly the most important instruments were the drum, the various kinds of flutes and the panpipe. Early writers frequently speak of the Indians dancing to the music of the pipe and tabor. The ancient potters have left us representations of these scenes on their water vessels (Plate V, Figs. 1 and 2). These dances appear to have remained unchanged in 1649 when Alonso de Ovalle wrote this quaint account:—

Their way of dancing is with little jumps, and a step or two, not rising much from the ground, and without any capers such as the Spanish use; they dance all together in a ring.<sup>1</sup>

A number of songs have been recorded which have been known to the Indians for generations, and believed by them to have been handed down unchanged, but their authenticity is, of course, doubtful—even the source from which they came being uncertain. Negroes were introduced early into all the Spanish colonies, and doubtless many of their tunes were adopted by the Indians. Garcilasso tells us that when he left Peru in 1560 there were then five Indians residing in Cuzco who were great masters on the flute, and could play readily, by book, any tune that was laid before them.<sup>2</sup> In view of these conditions, we may well be sceptical concerning the claims of any music said to be pre-Spanish.

We now come to that much vexed question, What musical scale was known to the ancient Peruvians? In the absence of any authentic music we must look to their instruments as the only source of information. It has been believed commonly that they employed the five-toned or pentatonic scale, so widely used in the primitive music of various peoples, which one of our most eminent musical scholars and critics insisted “represents a stage in musical development and is neither a racial nor geographical indication.”<sup>3</sup> In this scale the step of a semitone is avoided by omitting the fourth and seventh degrees in major and the second and sixth in minor.

Some of the scales given in this paper seem to indicate the use of this five-toned scale, but there are puzzling exceptions. If there were five Indians at Cuzco alone, in 1560, who could play anything by note, there must have been many more in other parts of the empire. These Indians played from European music, and of course, were familiar with our diatonic scale. The number who are familiar with our diatonic scale has been constantly increasing for more than three hundred years, especially in the neighborhood of the larger towns where it is not uncommon to find

<sup>1</sup>*Historical Relation of Chile*, 117.

<sup>2</sup>*Royal Commentaries of Peru*, Part 1, Book 2, Chap. 14.

<sup>3</sup>H. E. Krehbiel in *New York Tribune*, September 8, 1901

panpipes tuned to our intervals, or at least as near as the Indians could make them.

Some recent studies seem to prove that some of the old Inca music is still to be heard in the Peruvian sierras, and as songs are likely to be retained longer than almost any other feature of Indian life, this is possible. An article by Sr. Alberto Villalba Muñoz, in "*Inter-America*" for April, 1922, first called my attention to the work of Daniel A. Robles in recording Indian music. Muñoz says:—

To Señor Daniel A. Robles, Peru today owes the key and point of departure that make it possible to recognize the true Incan music, and to distinguish it with absolute certainty from the colonial music.

This means that one is in the five tone and the other in our twelve tone scale. The Incan scale is given as follows:—Re, Fa, Sol, La, Do. This is the minor form of the pentatonic scale, using Re as the fundamental tone. In this scale there are no semitones. By substituting others of the above notes for Re as the fundamental we shall get major as well as minor keys.

Sr. Robles' claim that he has recorded the old Incan music is endorsed by Raoul and Marguerite d'Harcourt in "*La Music dans la Sierra Andine de la Paz a Quito.*"<sup>1</sup> They state that they found Robles in Lima but were not fortunate enough to hear him render these airs upon the piano.

Later Madame d'Harcourt wrote down some two hundred Indian songs which they say gave them "A complete view of folk-music of the Andean region." Some of the recorded songs were pure Inca pieces in the five-tone scale, others they style mixed-breed. These last they consider to have been originally Incan songs that have been much changed since the Indians came in contact with the Spaniards.

Since writing the above I have met Señor Robles and by invitation passed a most enjoyable hour with him at his temporary New York home. I found him a very agreeable, intelligent gentleman, and an enthusiast in his work. He played to me quite a number of songs that he has recorded. They certainly are primitive; in the five-tone scale, and differ greatly from the modern Indian music.

After studying the work done by Señor Daniel A. Robles which has been confirmed by José Castro, Leandro Albiña, Monsieur and Madame d'Harcourt, and others, I think we may consider the scale problem solved. The Inca used the pentatonic scale.

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<sup>1</sup>*Journal de la Société des Americanistes de Paris*, N. S. Tome XII, pp. 21-54, 1920.



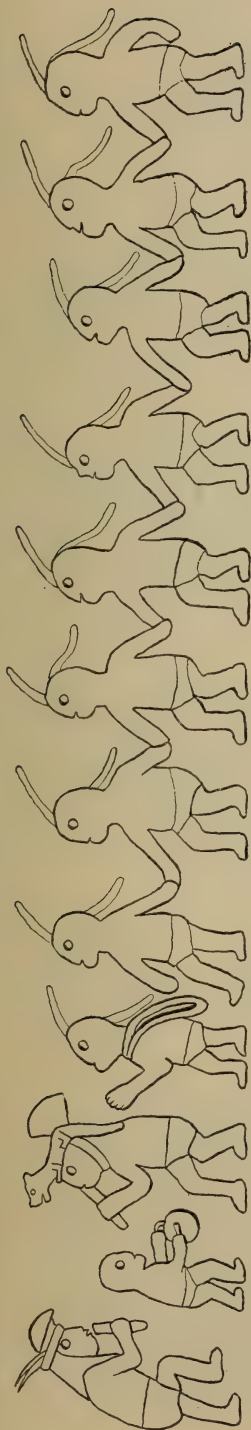


Figure 1.



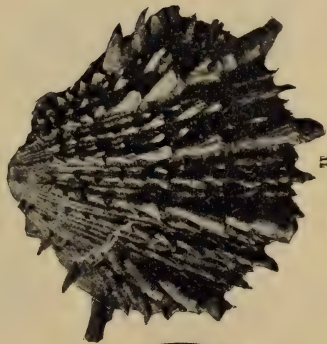
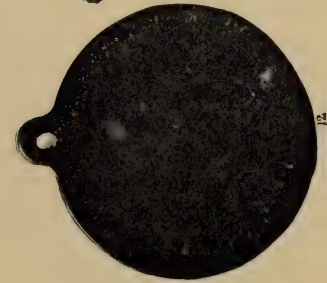
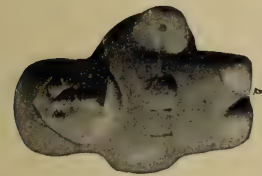
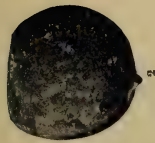
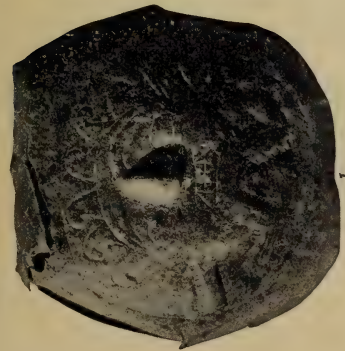
Figure 2.

Decorations from Ancient Peruvian Terra Cotta Vessels showing Musical Instruments in Use.

3481

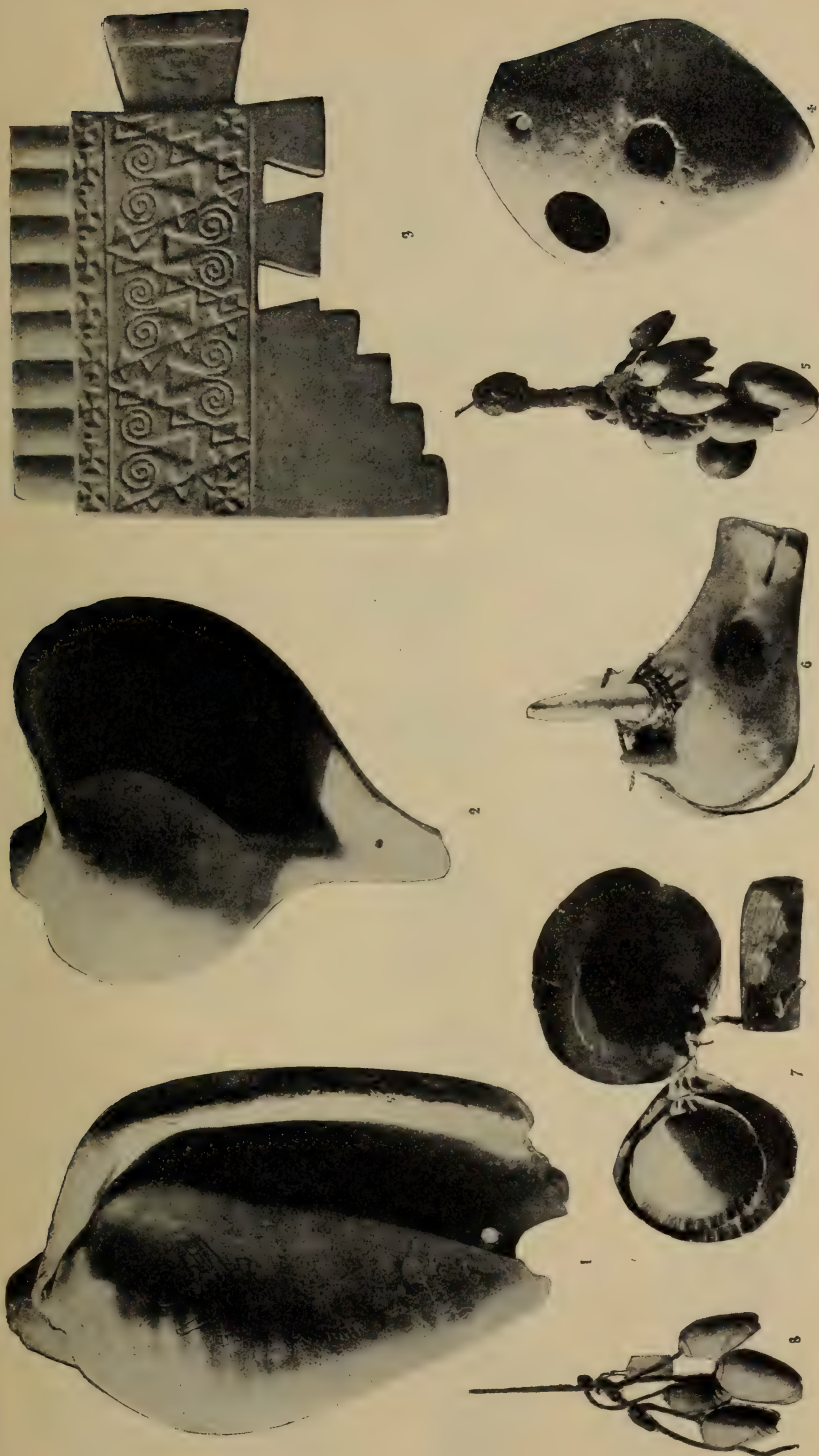






Musical Instruments: Drums, Rattles, Bells and Cymbals.





Musical Instruments: Trumpets and Rattles of Shell and a Syrinx.



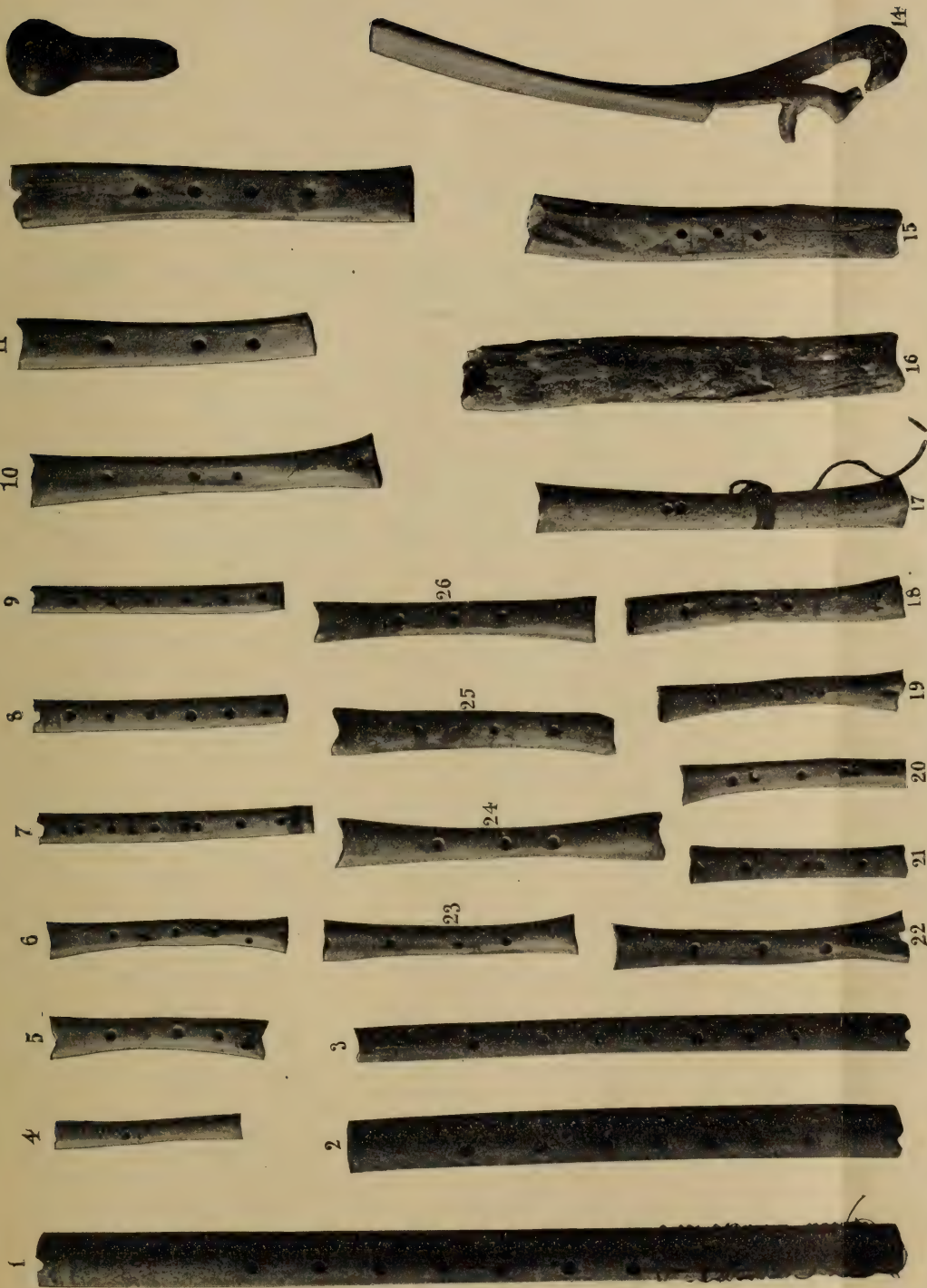




Musical Instruments: Whistles, Panpipes, Syrinx, and Trumpet.

3474





Types of Peruvian Flutes.





# INDEX

- Abandoned pueblos, reported by Spanish explorers, 25.
- Abandonment of pueblos, Blanco, 94; Galisteo, 22, 106, 107, 109; Largo, 102; pre-Spanish ruins, 110-111; San Cristobal, 29; San Lazaro, 29, 95, 102.
- Acknowledgments, 11, 130-131.
- Adobe, use in pueblos, Blanco, 90; Galisteo, 105, 108, 109; San Cristobal, 51; San Lazaro, 100.
- Age, buildings, San Cristobal, 46, 49, 50, 51, 56, 57, 63, 67; castration of dogs, 201; comparative, San Cristobal ruins, 44; Pueblo Blanco, 87; Pueblo Largo, 69, 73, 102; Pueblo San Lazaro, 102; Pueblos San Lazaro and San Cristobal, 97; relative, pueblo ruins, 87; relative, ruins in Galisteo Basin, 102; San Lazaro refuse heaps, 99; superimposed culture layers, San Cristobal, 57.
- Agriculture, possibilities for, Galisteo pueblos, 38, 111; Blanco, 86; Largo, 69; San Lazaro, 96; Shé, 80.
- Allen, Glover M., cited, 196.
- Alphabet, Hidatsa, 131-132.
- Altar, Pueblo Blanco, 91.
- Alvarado, cited, 22.
- Animal bones, found at Pueblo Galisteo, 108; remains of European, Galisteo pueblos, 112; San Cristobal, 55, 62-63; scarcity of, Galisteo pueblos, 111.
- Archæological sites, Rio Grande drainage, 7-8; Galisteo Basin, 31.
- Archery, Hidatsa, 171.
- Architecture, Tano, 112.
- Arikara, 129, 284; dogs, 197-198.
- Arrow, Hidatsa, charm against magpies, 182; game, 168-169; shooting game, 155; types of, 162, 299.
- Arroyo Jara, 38.
- Artifacts, excavated Galisteo pueblos, 9, 10, 111; Blanco, 92, 93; Colorado, 76, 79; Galisteo, 108; Largo, 72; San Cristobal, 55, 59, 62, 66; San Lazaro, 101; Shé, 84; Tanos and Jemez pueblos, 111.
- Assiniboin, 142.
- Awa-hi'tsi-kuwac, rescue of, 259-261.
- Aymara, 324.
- Badgers, Hidatsa, hunt for, 300-301; preparation and cooking, 301.
- Bag, Hidatsa, skin, construction and use of, 272-274; tobacco, 244.
- Baggage, arrangement in Hidatsa tent, 244.
- Baling grass, Hidatsa method of, 177-178.
- Balls, stone, Pueblo San Lazaro, 20.
- Bandelier, Adolf F., cited, 8, 18, 22, 24, 34, 36, 49.
- Bark, Hidatsa horses fed with, 175-176, 179, 208.
- Basket, Hidatsa, dog travois, 218-219, 220, 276, 283; hoop game, 219; horse travois, 219, 276; skin, 161.
- Bathing, Hidatsa, 157, 168.
- Battle, sham, Hidatsa, 170.
- Beds, Hidatsa, arrangement of, 292-294; construction of, 244, 294; position in tent, 244; position in shelter tent, 224; temporary camp, 259.
- Beliefs, Hidatsa, concerning dogs, 204, 213, 229, 230; concerning horses, 142, 145, 150, 229.
- Bell, cast metal, Pueblo San Cristobal, 59; copper, Pueblo Galisteo, 109.
- Bells, copper, Peruvian, 321-322.
- Benavides, Fr. Alonzo de, cited, 27.
- Bins, Galisteo Basin ruins, 54, 101.
- Birds, roasting, Hidatsa, 166.
- Blackbirds, Hidatsa hunting of, 155.
- Black Mouth society, Hidatsa, 263.
- Black-tailed Deer Imitators, Hidatsa, 284.
- Blanco. See Pueblo Blanco.
- Blood, broth, Hidatsa preparation of, 237-239; pudding, Hidatsa preparation of, 239-240.
- Bobtailed dogs, Hidatsa, 213.
- Bones, cracked for grease and marrow, Hidatsa, 174, 301-302.

- Bonilla, Francisco Leiva, cited, 13.  
Boundaries, Galisteo Basin, 35-36.  
Bow, Hidatsa, 161, 162, 299.  
Brackenridge, H. M., cited, 197.  
Breaking colts, Hidatsa method of, 150-151.  
Breeding, Hidatsa, dogs, 214-215; dogs, period for, 199; horses, time for Hidatsa, 150.  
Bridles, Hidatsa, 158; types of, 182-185.  
Brooms, Hidatsa, 161.  
Buckbrush-pit-timber, Hidatsa tradition concerning, 172-173.  
Buffalo-bird-woman, information as to dogs, Hidatsa, 199-230; narrative of hunt, Hidatsa, 231-262.  
Buffalo birds, Hidatsa hunting of, 165.  
Buffalo hunt, Hidatsa, 154, 248, 294; Mandan, 141; skin caps, Hidatsa, 251.  
Buildings, pueblo, descriptions of, Colorado, 75, 77; Blanco, 86; Galisteo, 105-106; Largo, 69; San Cristobal, 48, 49, 52-57, 59-64; San Lazaro, 97-100; Shé, 81; height of, San Cristobal, 64; historic, San Cristobal, 63, 66; number of, San Cristobal, 43; number excavated, 9; orientation of, Blanco, 86; orientation of, Galisteo, 106; orientation of, Shé, 81; position of, Largo, 68; superposition of, San Cristobal, 52.  
Bull-boat, Hidatsa, bound on horse travois, 216; bringing in wood with, 209-211; buffalo skin used for, 285; care on the hunt, 258; construction of, 253, 276-277, 295; crossing the Missouri in, 248-249, 271-272; descending the Missouri in, 294-295, 296; dimensions of, 285; lashing to travois, 276, 285-287; loading of, 210, 253, 254, 255; order in floating down the Missouri, 295-296; paddling, 256; towed by swimming horse, 185; transportation of, 232, 285-287; travel by, 253-256, 258, 259.  
Burdens, carried by Hidatsa dogs, 212.  
Burial mounds, refuse heaps as, Galisteo Basin, 111.  
Burials, Pueblo Largo, 72; Pueblo San Cristobal, 59, 65-66.  
Butchering, Hidatsa, methods of, 227-228, 246, 249, 251, 307.  
Camp circle, Hidatsa, 266.  
Campfire, Hidatsa, 244.  
Camps, Hidatsa, 235, 237, 240, 265, 266.  
Captives, Peruvian treatment of, 321.  
Castañeda, cited, 13-15, 16, 22, 23, 110.  
Castration, Hidatsa dogs, 146, 201; Hidatsa horses, 146-149, 150.  
Ceiling construction, Pueblo San Cristobal, 62.  
Ceremonial objects, Pueblo San Cristobal, 55.  
Ceremonies, Hidatsa, 212, 230, 292.  
Chamuscado, Francisco Sanchez, cited, 12, 23.  
Chapel, near Pueblo San Cristobal, 48; near Pueblo San Lazaro, 97-98.  
Charm, Hidatsa, individual, 165; protecting horses, 181-182, 183.  
*Chicha*, Peruvian drink, 325.  
Chuño, Aymará festival, 324.  
Church, Pueblo Galisteo, 107.  
Cicuye, Castañeda's account of, 14; identification of, 17.  
Cienega, 26, 28.  
Climate, Galisteo Basin, 39; Southwestern United States, changes in, 39.  
Colonization, New Mexico, history of, 12.  
Colorado. See Pueblo Colorado.  
Colt, Hidatsa, birth and care of, 145-146; training of, 150-155.  
Communal buildings, pueblo, Blanco, 86-87; Colorado, 75-76; Galisteo, 105-107; Largo, 69-70; San Cristobal, 43-44; Shé, 81.  
Concretions, Pueblo Largo, 71.  
Construction, pueblos, material for, 87; San Cristobal, 49, 54.  
Corn, culture, Hidatsa and Mandan, 128; fed to dogs, Hidatsa, 201; fed to horses, Hidatsa, 180; preparation and cooking, Hidatsa, 159; skin mortar for, Hidatsa, 271.  
Coronado, Francisco Vazquez de, cited,

- 12, 13; route from Bernalillo to Pecos, 18.
- Corral, Hidatsa earth-lodge, 156, 159-160; Hidatsa war, 160-161; Pueblo Colorado, 75-76; Pueblo San Cristobal, 43, 45, 48.
- Corrugated pottery, Pueblo Galisteo, 109; Pueblo Largo, 72; Pueblo San Cristobal, 64-65.
- Costume, Hidatsa, 157, 158, 165, 173, 232-233.
- Cottonwood bark, fed Hidatsa horses, 175-176, 179.
- Coup striking, Hidatsa, 155.
- Courts, pueblos, Blanco, 86; Colorado, 75; Galisteo, 106; San Cristobal, 44-45; San Lazaro, 97; Shé, 81.
- Cradle bundle, Hidatsa, 270.
- Cross-section, San Cristobal building, 60-61.
- Cultural connections, Polynesia and Brazil, 333.
- Culture, contemporaneity, Galisteo region, 102; homogeneity, Galisteo Basin, 111; identity, Pueblos Largo and San Cristobal, 72; Tanos and Jemez, 111.
- Cymbals, Peruvian, 322.
- Dam, Pueblo Blanco, 88-89; Pueblo San Cristobal, 46-47; Pueblo San Lazaro, 99; Pueblo Shé, 83.
- Dances, ancient Peruvian, 346.
- Data, Hidatsa, method of obtaining and presentation, 127, 130.
- Date, horses obtained by Hidatsa, 142.
- Decoration, Hidatsa bull-boat paddles, 256.
- Deer-horn saddle, Hidatsa, 191.
- Defense, position of Pueblo Galisteo for, 104.
- Dialects, Hidatsa and Mandan, 129.
- Diet, European influence on, 112.
- Dimensions, bull-boat, Hidatsa, 285; chapel, Pueblo San Cristobal, 48; dam, Pueblo Blanco, 89; doorways, Pueblo Blanco, 90; doorways, Pueblo San Lazaro, 101; excavated rooms, 114-124; kivas, Pueblo San Cristobal, 45, 46; niches, Pueblo Blanco, 90; Pueblo Blanco, 88; Pueblo San Lazaro, 101; site, Pueblo Shé, 81; shrine room, Pueblo Blanco, 92.
- Disguise, Hidatsa hunters, 250-251.
- Dog, Hidatsa, culture complex, 127-128; culture, 196-230; in Hidatsa culture, 130; imitators' society, 284.
- Dogs, Hidatsa, beast of burden, 141; eating of, 230; general use of, 206-209; gravid, care of, 199; on hunting party, 231-232; killing of, 200-229; never eaten for food, 200; number in lodge, 204, 206, 212, 215; origin of, 198-199; Sioux, characterized, 197, 229; training of, 211-212; and the travois, 299; types of, 204, 287; unconscious, method of reviving, 211; in the village, 204-205.
- Door, Hidatsa lodge, 180; Hidatsa tent, 292, 300.
- Doors, Pueblo Galisteo, 108; Pueblo San Cristobal, 51.
- Doorways, pueblo buildings, Blanco, 90, 92-93; Colorado, 76, 78; Largo, 72; San Cristobal, 54-55, 57, 58-59, 64; San Lazaro, 101; Shé, 84.
- Double whistling jar, Peruvian, 343-344.
- Dress, buckskin, Hidatsa, 234.
- Drums, Peruvian, 320, 321.
- Drying stage, Hidatsa, 156; winter, 174, 176.
- Eagles, bones, found in San Cristobal, 63; Hidatsa sacred birds, 278.
- Earth-lodge roofs, Hidatsa, use of, 202.
- Earth-lodges, Hidatsa, 174.
- Elevation, Galisteo region, 39.
- Enemy, raids, account of Hidatsa, 155; training of horse to leap, Hidatsa, 154-155.
- Espejo, Antonio de, cited, 12, 23, 25, 34, 71, 111.
- Estacado. See Pueblo Estacado.
- Etiquette, Hidatsa, 237, 240, 244, 280-281.
- European influence, Tano pueblos, 112.



- Excavations, Galisteo pueblos, 9, 10, 49-66, 72, 78, 83-84, 90, 100-101.
- Exploration, Spanish, Galisteo region, 12-16.
- Estancia valley, 34.
- Face paint, Hidatsa, 257.
- Fauna, Galisteo Basin, 40.
- Feast, Hidatsa, cutting tent skins, 292; return from the hunt, 310.
- Fee, Hidatsa, castrating dogs, 201; castrating horses, 146, 149; painting travois basket, 221.
- Feed, Hidatsa, for dogs, 227; for horses, 180.
- Fetiches, found in Galisteo ruins, 9.
- Fire, conservation of, Hidatsa, 167, 269; method of building, Hidatsa, 166; traces of, in Galisteo ruins, 51, 72, 78, 83, 101, 108.
- Firedrill, Hidatsa, 269.
- Fire-making, Hidatsa method of, 268-269.
- Fireplace, Hidatsa tipi, 268; Pueblo Blanco, 90, 91-92; Pueblo Colorado, 78; Pueblo Galisteo, 108; Pueblo Largo, 72; Pueblo San Cristobal, 48, 51, 54, 57, 58, 62, 64; Pueblo San Lazaro, 101; Pueblo Shé, 83.
- Firewood, place in Hidatsa lodge, 208.
- Flint and steel, Hidatsa, 268-269.
- Floor construction, pueblo, Blanco, 90; Colorado, 78; Largo, 70; San Cristobal, 50, 51, 55, 57, 58, 59, 62, 64; Shé, 84.
- Flora, Galisteo Basin, 39-40.
- Flutes, Peruvian, 320, 335-340.
- Fodder, Hidatsa horses, 175-178.
- Food, Hidatsa, 172, 179, 210, 241, 252; Hidatsa, for dogs, 200, 201-202, 241; Hidatsa, for horses, 157, 159; supply Tano, 40.
- Fording, with travois, Hidatsa, 241.
- Foundation, poles, Hidatsa and Mandan tipi, 267; tie, Mandan tent, 289-291.
- Four-pole, foundation for tipis, 289; tipi tie, 268.
- Frame, Hidatsa shelter tent, 223-224; Hidatsa tent, 235; Hidatsa travois, 218; saddles, Hidatsa, 299.
- Framework, Hidatsa tent, 243.
- Franciscan missions, Galisteo pueblos, 8-9; New Mexico, 12.
- Fuel, Hidatsa, 206-207.
- Galisteo, Basin, description of, 34; basin, location of ruins in, 8; basin, map of, 36-37; creek, route of, 21; pueblos, 8; pueblos, identity mentioned by Coronado, 16-17; pueblos, importance of determining those inhabited in 1641, 19; region, Spanish expeditions visiting, 13.
- Galisteo. See Pueblo Galisteo.
- Game, Galisteo region, 40; Hidatsa ownership of, 240.
- Games, Hidatsa, boys, 168, 170; hoop, 283.
- Glazed pottery, Galisteo pueblos, 66, 109, 112.
- Gomez, Maurice, acknowledgment to, 11.
- Gonzales, J. N., acknowledgment to, 11.
- Goodbird, Edward, acknowledgment to, 127, 129; biographical sketch, 131; birth of, 269-270; narrative of his near drowning, 297-298.
- Goose Women society, Hidatsa, 294.
- Gopher, hunting, by Hidatsa, 155, 165, 166, 168, 169, 170; roasting by Hidatsa, 166.
- Gourd rattle, Peruvian, 322.
- Gran Quivira, 8.
- Grass, dry, Hidatsa horse feed, 176-178, 209.
- Growth, Galisteo pueblos, 79.
- Guarding, Hidatsa, horses, 155, 157, 171, 266; village, 205.
- Guiding horses, Hidatsa, 164.
- Habitat, Hidatsa, 128.
- Habitation, center of, Pueblo San Cristobal, 67.
- Hair dress, Hidatsa, 163, 165.
- Halters, Hidatsa, 158, 159, 161, 163, 164, 182. See also Bridles.
- Hammer, stone, Hidatsa, 284.

- Hand, impression on rock near pueblo, 79.
- Hay, Hidatsa horse feed, 178, 209.
- Headband, Hidatsa, 195.
- Heart, buffalo, Hidatsa use of, 269.
- Herd, horses, Hidatsa, size of, 150, 157, 164, 176, 194.
- Herding horses, Hidatsa, 155-172.
- Hidatsa, traditional origin of, 129.
- Hide, Hidatsa preparation for lariat making, 187; Hidatsa use for tent cover, 291.
- Historic ruins, Galisteo, 106, 109; San Cristobal, 41, 44, 63, 66; San Lazaro, 95, 96, 97.
- Historical, background, Galisteo pueblos, 12-33; data, Hidatsa horses, 141.
- Hobbling horses, Hidatsa, 155, 157, 165, 181, 190.
- Hobbles, Hidatsa types of, 189-190.
- Honor marks, Hidatsa paddle decorations, 256, 257; Hidatsa prerequisite to painting travois basket, 220.
- Hook, Hidatsa use of, 209.
- Hoop game, Hidatsa, 283.
- Horse, Hidatsa, care in winter, 172-180; considered sacred, 142; culture, 127, 141-195; culture complex, 127-128; descriptions of, 164; equipment for, 299; ideas concerning, 142; interrelations with dog culture, 128; number of, 174, 264; origin account, 141-142; raids, 173; recently obtained, 141.
- Horsegear, 182-194.
- Houses, single room, San Cristobal, 42.
- Hunt, Hidatsa, afoot with dogs, 231-262; badger, 300-301; bow and arrows used in, 173; bridle used in, 185; buffalo, 245-246, 248, 258, 304-307; bull-boat and travois, 210-211; dog and travois, 299-311; dogs not employed in, 230; horses trained for, 153-154, 181; members of party, 295; return from, 310; tribal, to the Yellowstone, 263-298.
- Huntington, Archer M., acknowledgment to, 7.
- Idols, in pueblo ruins, 93; Rio Grande pueblos, 111.
- Images, Pueblo Blanco, 91, 92, 102; Pueblo Largo, 70-71; Pueblo San Lazaro, 102.
- Inca, musical instruments of the, 313-347.
- Inscriptions, on rocks, near Pueblo Blanco, 93.
- Instrumental music, developmental stages of, 320.
- Intermarriage, Hidatsa and Mandan, 128.
- Invention, independent, South American panpipe, 325.
- Jaramillo, cited, 20.
- Kennels, Hidatsa construction of, 202-204.
- Kidney, buffalo, Hidatsa consider a delicacy, 252.
- Kiva, pueblo, construction, 57, 59; found in Galisteo pueblos, 111; possible, San Lazaro, 97; scarcity in Tanoan pueblos, 111; Pueblo Colorado, 77; semi-subterranean, Largo, 70; San Cristobal, 57, 59.
- Kivas, excavated at San Cristobal, 66; Galisteo, 10; not found in prehistoric Pueblo Galisteo, 106; Pueblo Blanco, 87-88; Pueblo Colorado, 76-77; Pueblo Largo, 69; Pueblo San Cristobal, 45-46; Pueblo Shé, 81-82.
- Kotyiti Pueblo, 7.
- Labor, Hidatsa, division of, 227.
- Ladder, Hidatsa, notched, 177.
- Largo. See Pueblo Largo.
- Lariats, Hidatsa method of making, 185-189.
- Leader, Hidatsa dogs, 228; Hidatsa, hunting party, 245, 263.
- Leggings, Hidatsa type, 233.
- Length, Peruvian flutes, 336.
- Like-a-fish-hook Village, Hidatsa, 172, 209, 213, 262, 297.
- Load, Hidatsa, for dog, 227-228; for horses, 310; manner of binding on travois, 220.

- Loading, Hidatsa, mule, 277; pony, 278; wood, 207.
- Loads, Hidatsa, bull-boats, 295; dog travois, 283-285; mules, 274; pack animals, 272; transported by dogs, 231-232.
- Location, pueblos, Blanco, 85; Colorado, 74; Galisteo, 103-104; San Cristobal, 41, 52, 62-63; San Lazaro, 20, 95, 101; Shé, 84.
- Magpies, Hidatsa protect horses from, 181-182.
- Maize, charred, Galisteo ruins, 10; cultivation of, Galisteo pueblos, 112; fermented drink made of, Peruvian, 325.
- Mandan, 129, 267.
- Maps, pueblos, Blanco, 84; Colorado, 74; Galisteo, 102; Largo, 68; San Cristobal, 40; San Lazaro, 94; Shé, 80.
- March, Hidatsa, order of procedure, 236-237, 264-265.
- Marimba, 320.
- Marrow, eaten by Hidatsa, 268.
- Masonry, pueblo, 87; Largo, 72; San Lazaro, 100-101; San Cristobal, 54.
- Maxidiwiac, 129, 130. See also Buffalo-bird-woman.
- Maximilian, Prinz zu Wied, cited, 197.
- Meat, Hidatsa, cuts in butchering, 246, 247; drying, 174; drying, Mandan narrative, 142; fed to dogs, 200, 201-202; roasting, 235-236, 268; transportation, 227-228, 235.
- Metates, cache of, San Cristobal, 45.
- Migrations, Tano peoples, 26-30.
- Mission districts, Spanish, in Tanos region, 26.
- Moccasins, Hidatsa types, 232-233, 283.
- Modern structures, Pueblo Galisteo, 105.
- Mortar, Hidatsa type, 270-271.
- Mounds, San Cristobal, 44.
- Mounting horse, Hidatsa method of, 170.
- Mules, Hidatsa use on hunt, 274, 277.
- Musical development, stages in, 323; instruments, Peruvian, 346.
- Names, Hidatsa, for dogs, 212-216, 281, 284, 299; for horses, 149, 164, 194-195, 281; for mules, 274; personal, 165, 284, 288; for pony, 278, 279.
- Naming customs, Hidatsa, for dogs, 212, 213; personal, 294.
- Narratives, important, Spanish exploration in the Southwest, 13.
- Niches, pueblo ruins, Blanco, 90, 92; Galisteo, 108; San Cristobal, 61; San Lazaro, 101.
- Occupation, period of, pueblos, Blanco, 88, 94; Colorado, 79; Largo, 73; San Cristobal, 67; San Lazaro, 95; Shé, 81, 84; Tanos, of Galisteo Basin, 32.
- Octaves, manner of producing, Peruvian panpipes, 323.
- Offerings, at shrine, Pueblo Blanco, 92.
- Oñate, Don Juan de, cited, 24, 26.
- Orchestra, of panpipes, Lake Titicaca, 326.
- Ornament, gold, trumpets in use, 341.
- Paako pueblo, 27, 28.
- Pack animals, Hidatsa, 272; dogs as, 212; horses, 181, 182.
- Pack saddles, Hidatsa, 182, 191, 261.
- Pack strap, Hidatsa, 195, 209, 207.
- Paddle, Hidatsa, bull-boat, 256; stirring, 237.
- Paddling, Hidatsa bull-boats, 295, 297.
- Pad saddle, Hidatsa, 191.
- Paint, Hidatsa, bags for, 257; for travois baskets, 219, 220.
- Painting, Hidatsa, body, 158, 173; face, 257.
- Pankey, Benjamin F., acknowledgment to, 11.
- Panpipes, comparison Brazilian and Solomon Islands, 334; complementary scales, Peruvian, 326; and culture connection, 332-335; distribution in South America, 325; form of, Peruvian, 325; material for, 326; Peruvian, 323-332; Solomon Islands, 329; terra cotta, 330-331.



- Parading horses, Hidatsa, 153.  
 Parfleche, Hidatsa, 274.  
 Pasturing horses, Hidatsa, 155-172, 178, 179.  
 Paunch, buffalo, Hidatsa use of, 225; wrappings, Hidatsa preparation of, 253.  
 Pecos, identification in Spanish narrative, 17.  
 Percussion, instruments of, 321-322.  
 Pestle, Hidatsa, 271.  
 Pictographs, near pueblo ruins, Blanco, 93; Colorado, 79; Largo, 69; San Cristobal, 42, 43.  
 Pipes, Hidatsa, 244.  
 Piro pueblos, 7.  
 Pitch, Peruvian flutes, 337; Peruvian panpipes, 330.  
 Plains Indian dog, distribution of, 196.  
 Plaster, on Pueblo walls, Blanco, 90, 92; Colorado, 78; Galisteo, 108; Largo, 72; San Cristobal, 64; San Lazaro, 101; Shé, 83.  
 Pocket, wall, San Cristobal pueblo, 54.  
 Poles, Hidatsa tent, dragged by dogs, 225; framework, 243; number of, 292; transportation of, 193; Hidatsa travois, 216-218.  
 Population, pueblos, Blanco, 86; Galisteo, 103, 110; San Cristobal, 41, 66; Tano, 24, 26, 27, 28, 31-33.  
 Porcupine, Hidatsa capturing and eating, 302-303.  
 Potato festival, Aymará, 324.  
 Potsherds, Galisteo ruins, 10; refuse heaps, Pueblo San Lazaro, 99.  
 Pottery, dances shown on Peruvian, 346; drums shown on Peruvian, 320, 321; European influence on, Galisteo pueblos, 112; glazed, 66, 109, 112; Hidatsa, 268; musical instruments depicted on, Peruvian, 319; panpipes on, Peruvian, 323, 324; Pueblo Blanco, 92, 93; Pueblo Colorado, 79; Pueblo Galisteo, 109; Pueblo Largo, 69, 72, 73; Pueblo San Cristobal, 52, 55, 57, 59, 63, 65, 66; Pueblo San Lazaro, 97, 101; Pueblo Shé, 84; stratigraphic variation in, Galisteo pueblos, 111; whistling jar, Peruvian, 343-344.  
 Prayers, Hidatsa, 149, 179-180.  
 Prehistoric pueblos, Blanco, 93-94, 110; Colorado, 79, 110; Galisteo, 106, 109; Largo, 73, 110; San Cristobal, 20, 41, 56; San Lazaro, 98-99; Shé, 84, 110.  
 Property, Hidatsa dogs as, 206, 213.  
 Pueblo Blanco, 19, 20, 21, 28, 68, 85-94, 110.  
 Pueblo Colorado, 74-80, 119-120.  
 Pueblo Estacado, 68.  
 Pueblo Galisteo, 8, 21-26, 103-110, 123-124.  
 Pueblo Largo, 68-73, 85, 119.  
 Pueblo Pecos, 24.  
 Pueblo San Cristobal, 19, 20, 22, 24, 25, 26, 27, 29, 41-66, 114-119.  
 Pueblo San Juan, 29.  
 Pueblo San Lazaro, 20, 21, 28, 29, 94, 95-102, 122-123.  
 Pueblo San Lucas, 24, 25, 26, 27.  
 Pueblo San Marcos, 22, 24, 25, 26, 27, 28, 110.  
 Pueblo Santa Ana, 27.  
 Pueblo Santo Domingo, 24.  
 Pueblo Shé, 19, 20, 80-84, 120-121.  
 Pueblo de los Silos, 15, 21, 25.  
 Pueblo Tunque, 19, 21.  
 Pueblo, remains, Rio Grande drainage, 7-8; villages, seen by Spanish explorers, 22.  
 Puppy, Hidatsa, care at birth, 199-201; how killed, 204.  
 Purchase, of dogs, Hidatsa, 204, 206.  
 Purging, description of Hidatsa, 157, 158.  
 Quiver, Hidatsa, 161.  
 Quivira, Spanish expedition to, 13.  
 Quirt, Hidatsa, 163.  
 Racing, Hidatsa, bridles for, 183, 185; saddles for, 280.  
 Raids, Hidatsa care of horses during, 178.  
 Rattle, Peruvian, 322.  
 Rebellion, Pueblo, 28-29, 30.  
 Reeds, Peruvian panpipes, 323.  
 Refuse heaps, pueblo, Blanco, 88;



- Colorado, 77; excavation of, 10;  
Galisteo, 107; Galisteo Basin, 111;  
Largo, 70; San Cristobal, 45, 46, 65-66;  
San Lazaro, 99; Shé, 82.
- Relationship, members Hidatsa hunting party, 288-289.
- Reservoirs, pueblo, 88-89; Colorado, 77; Galisteo region, 38; San Cristobal, 42, 45, 46-47; San Lazaro, 99-100; Shé, 82, 83.
- Resonator whistle, Peruvian, 340-341.
- Rhythm, importance in music, 319-320.
- Riding, horse, Hidatsa manner of, 153, 164-165, 170, 278, 280, 281, 287-288; on travois, Hidatsa, 216.
- Rito Galisteo, 38.
- Robe, Hidatsa, 234.
- Rock piles, Pueblo San Cristobal, 43.
- Rock-shelter, Pueblo San Cristobal, 42, 47-48.
- Rock tanks, for water, Pueblo San Lazaro, 99-100.
- Rodriguez, Friar Augustin, cited, 12, 23.
- Roofs, Hidatsa earth-lodges, use of, 202.
- Rooms, excavated, pueblos, descriptions, Blanco, 86, 90, 92, 93; Colorado, 75, 78, 79; Galisteo, 106, 107-108; Largo, 69, 72; San Cristobal, 43, 49, 51, 53, 54, 56, 57, 61, 66, 99; San Lazaro, 100-101; Shé, 81, 83, 84; dimensions of, 114-124; number excavated, 9.
- Routes, Spanish explorers in New Mexico, 13, 16-26.
- Ruins, pueblo, Galisteo Basin, 31; general appearance, Pueblo Blanco, 86, 87; historic, Pueblo San Lazaro, 97; prehistoric, Pueblo San Lazaro, 98-99.
- Saddle, Hidatsa, description and types of, 190-191; dog travois, 219-220, 221, 282; not used in battle, 164; pad, 279; racing, 280; skins, 192-193.
- Sage, Hidatsa puppies smoked in, 200.
- Sale, Hidatsa dogs, 204, 206.
- San Cristobal Creek, 38.
- San Cristobal. See Pueblo San Cristobal.
- Sandia Range, 16, 18.
- Sangre de Cristo Range, 16.
- San Lazaro. See Pueblo San Lazaro.
- San Marcos. See Pueblo San Marcos.
- Santa Fé Mountains, 18.
- Scale, pentatonic, used by Inca, 315, 346, 347; Peruvian flutes, 335, 338-339; Peruvian panpipes, 323, 326, 329; Peruvian trumpets, 342.
- Settlements, on Galisteo Creek, 21.
- Shé. See Pueblo Shé.
- Shells, Peruvian, as musical instruments, 332; used for paint cups, 322.
- Shelter tent, Hidatsa, 221-224.
- Shrine, at pueblos, Blanco, 90-92; Colorado, 76; Largo, 70-71; Shé, 82.
- Sick, Peruvian curing of, 321, 322.
- Signals, Hidatsa, 229.
- Sinews, Hidatsa horse castration, 147, 148.
- Sioux dogs, description and distribution, 196-197.
- Sitting, Hidatsa manner of, 287.
- Skeletons, human found in pueblos, Blanco, 93; Colorado, 79; Galisteo, 106, 109; San Cristobal, 52, 62-63; San Lazaro, 101; Shé, 84.
- Skin-dressing, Hidatsa, 246-247, 292.
- Sledges, Hidatsa did not use, 220.
- Sleeping places, Hidatsa dogs, 245.
- Small-ankle, acknowledgment to, 130; narrative of, 179-180.
- Smallpox, extermination of Mandan and Hidatsa by, 128.
- Smoke, hole, Hidatsa manipulation of, 244; Hidatsa offering, 304.
- "Smoking" puppies, Hidatsa, 200.
- Snare, Hidatsa, for gophers, 165-166, 169, 170.
- Snow, melted for water, Hidatsa, 225-226.
- Snowblindness, Hidatsa cure for, 300, 302.
- Snowy Mountains, 16.
- Songs, Peruvian, 315, 319, 346, 347.
- De Sosa, Castaño, cited, 12-13, 24, 27.
- Spring, at pueblos, Blanco, 86; Largo, 69; Shé, 82-83.
- Springs, Galisteo Basin, 38.
- Speed, attained by Hidatsa dogs, 228.

- Spoons, Hidatsa, 159, 240.  
 Stage, Hidatsa meat drying, 245-246, 248, 258.  
 Stallions, Hidatsa, 149-150.  
 Stirrups, Hidatsa, 279.  
 Stone, used in pueblo construction, Blanco, 83, 90; San Cristobal, 51; San Lazaro, 96, 100-101; supply at Pueblo Shé, 80.  
 Story telling, Hidatsa, 240.  
 Streams, Galisteo Basin, 38.  
 Stringed instruments, Peruvian, 345.  
 Supernatural power, Hidatsa objects with, 163.  
 Swimming horses, Hidatsa, 151-152, 185, 272.  
 Syrinx, Peruvian, 323.
- Tabira, 8.  
 Tanks, Pueblo Blanco, 89.  
 Tano population, probable, 110-111.  
 Tanos, habitat of, 31; number and distribution of, 24-25, 26-29; pueblos, 8; pueblos, history under Spanish rule, 26-30; pueblos, listed, 27.  
 Taos, 24.  
 Tent, Hidatsa, collapse in snowstorm, 307-310; construction of, 291-294; cover, construction, 243; description of, used on hunt, 243-244; interior arrangement of, 292, 301; poles, dragged by pony, 278; securing to the ground, 243; setting up, 300; skins, cutting, 292.  
 Territory, controlled by Tanos, 31; extent of ancient Peruvian, 319.  
 Testing a puppy, Hidatsa, 200.  
 Teyas (or Tewa), 32, 110.  
 Thongs, Hidatsa travois basket, 219, 221.  
 Three-pole, foundation, 290-291; tipi tie, Mandan, 267, 268.  
 Thunder spirits, Hidatsa worship of, 294.  
 Timber supply, pueblos, Blanco, 86; Colorado, 75; San Lazaro, 96.  
*Tinya*, a guitar, 345.  
 Tigua pueblos, 7.  
 Tigux, 16-17, 18, 23.
- Tipi, Hidatsa, anchoring of, 267-268; cover, 278-279; cover, transportation of, 193; method of turning, 266-267; poles, 193, 194, 267, 268, 290-291; positions in circle, 266; ties, 289-291. See also Tent.  
 Topography, Galisteo Basin, 35; Pueblo Blanco, 85-86; Colorado, 74; Pueblo Galisteo, 103-104; Pueblo Largo, 68-69; Pueblo San Lazaro, 95-96; Pueblo Shé, 80-81.  
 Training dogs, Hidatsa, 211-212, 229.  
 Transportation, Hidatsa, 193-194; bull-boat by dogs, 285-287; bull-boats by women, 254; of meat, with dogs, 227-228, 251-252; meat on the hunt, 235, 247-248, 249, 250, 261; tent poles, 272.  
 Travel, Hidatsa, order on the march, 193.  
 Travois, Hidatsa, bull-boat transported on, 211; description of a makeshift, 193; dog, construction, 216-221, 281-283; horse, 219; horse, construction of, 275-276, 280; meat transported on, 226-228; loading, 207-208, 227, 252, 274-275; passed out of use, 220; paint for basket, 220; position in lodge, 208, 220; support for shelter tent, 300; training a dog to, 211; unloading of, 241; winter use of, 209; wood carried on, 206.  
 Trees, Galisteo region, 39-41.  
 Trumpets, Peruvian types of, 341-343.  
 Tunque. See Pueblo Tunque.
- Varela, Enrique, acknowledgment to, 11.  
 De Vargas, Diego, cited, 29.  
 Vehicles, used on Hidatsa hunt, 264.  
 Vents, Peruvian flutes, 336-337; Peruvian resonator whistle, 340.  
 Vibration numbers, Brazilian and Solomon Island panpipes, 334, 335; Chilean panpipe, 330; Ica panpipe, 329; Nazca panpipe, 330.  
 Villages, pueblo, identification by Spanish explorers, 23; number of Tano, 31-32.  
 Visions, Hidatsa, 163, 165, 212.

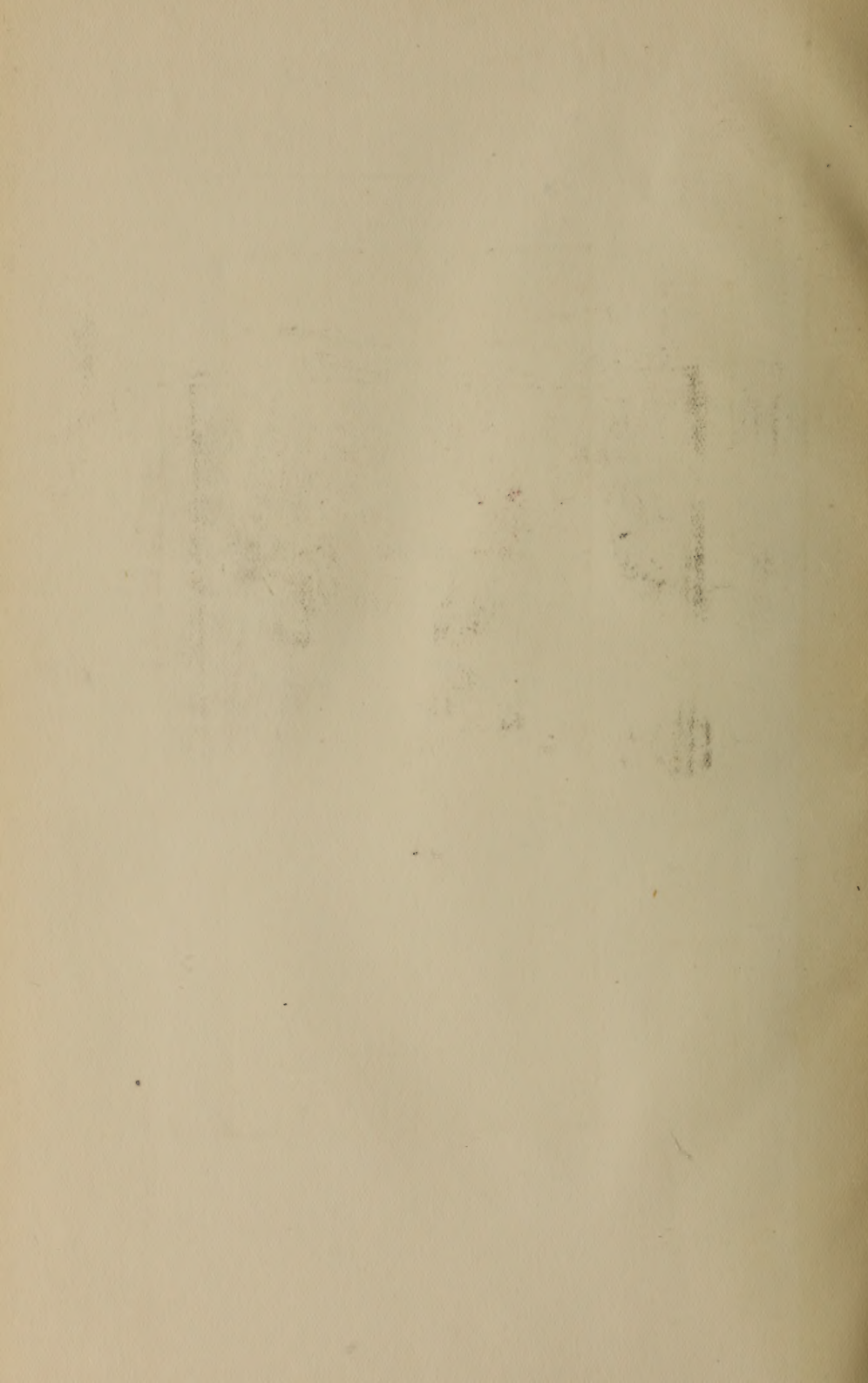
- Walls, pueblo ruins, construction, Blanco, 90, 92; Colorado, 75, 76, 78; Galisteo, 108; Largo, 70, 72; San Cristobal, 51, 52, 56, 57, 59, 61, 64; San Lazaro, 100-101; Shé, 82, 83; height of standing, Blanco, 90; height of standing, San Cristobal, 44, 50, 51; height of, 101; height of, Pueblo Shé, 83; stone, San Cristobal, 42, 45; thickness of, Pueblo Blanco, 90; thickness of, Pueblo Galisteo, 108; traces of old, San Cristobal, 42, 43.
- War, Hidatsa, bridles used in, 185; care of horses during, 156, 181; party, method of traveling, 181; training a colt for, 152-153, 154-155.
- Watch towers, pueblo ruins, 42, 47, 66, 81, 82.
- Water, for dogs, Hidatsa, 225-226, 243, 269.
- Water supply, pueblos, Blanco, 86, 88; Colorado, 74, 75; Galisteo Basin, 38; Galisteo ruins, 111; Galisteo, 104; Largo, 69, 72; San Lazaro, 96, 99-100; Shé, 80, 82-83.
- Watering horses, Hidatsa, 156, 167, 178, 181, 301.
- Weapons, Hidatsa, for hunting, 232, 299-300, 305; for war, 249.
- Weave, Hidatsa travois basket, 219.
- Whistle, double, North American, 325; resonator, Peruvian, 340-341.
- Whistling jar, Peruvian, 343-344.
- Whitewash on pueblo walls, Blanco, 90, 92; Colorado, 78; Galisteo, 108; San Cristobal, 54, 58, 61; San Lazaro, 101; Shé, 83.
- Wilson, Frederick N., acknowledgment to, 127, 129.
- Wind instruments, Peruvian, 323-344.
- Winter, care of horses, Hidatsa, 179-180; camps, Hidatsa, 173.
- Wolf-chief, acknowledgment to, 129; biographical sketch, 131; information on dogs, 225-230; narrative concerning origin of dogs, 198-199; narrative relating to horse culture, 141-195; narratives on hunt with dogs, 299-311.
- Wood, collecting by Hidatsa, 206-208, 209; supply, Pueblo Shé, 80.
- Ximena, account of, 14, 15; identification of, 16, 18, 20, 21-22, 25, 41, 103, 106.











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